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transportation plan

FOR
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1997 UPDATE
TO THE
PIONEER VALLEY REGIONAL TRANSPORTATION PLAN

PREPARED BY THE
PIONEER VALLEY PLANNING COMMISSION

THIS DOCUMENT WAS DEVELOPED WITH THE ASSISTANCE OF THE FEDERAL HIGHWAY ADMINISTRATION,
FEDERAL TRANSIT ADMINISTRATION, THE MASSACHUSETTS EXECUTIVE OFFICE OF TRANSPORTATION
AND CONSTRUCTION, THE MASSACHUSETTS HIGHWAY DEPARTMENT,
AND THE PIONEER VALLEY TRANSIT AUTHORITY.

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CHAPTER 1

1997 update to the pioneer valley regional transportation plan

The Pioneer Valley Regional Transportation Plan (RTP) outlines the direction of transportation planning and improvements for the Pioneer Valley through the year 2020. It provides the basis for the Transportation Improvement Program (TIP) as well as state and federal funding for regional transportation planning and projects. This document is an update to the current RTP (last published in 1993) and must be endorsed by the Pioneer Valley Metropolitan Planning Organization (MPO, described in Section II).

The RTP has been simplified and re-focused for 1997. Nearly all of the data in the 1993 RTP about existing transportation conditions has been removed since it is all contained in the many support documents used in the development of the update. The long range plan now concentrates on future deficiencies in our transportation infrastructure, presents the preferred strategies to alleviate those deficiencies, and in concert with regional goals and objectives and the Intermodal Surface Transportation Efficiency Act (ISTEA) legislation, creates a schedule of regionally significant projects that are financially constrained. In addition, the document is smaller and much easier to use.

Although the RTP focuses on transportation it is a comprehensive planning document. The Pioneer Valley has taken great strides in coordinating the RTP development process with other non-transportation planning efforts in the region. The Pioneer Valley Plan for Progress, published in 1994, presents a strong case for improving our transportation infrastructure to encourage growth and economic development. The plan also recognizes that the region's cities and towns are experiencing changes which will affect its people, landscape, economy, and governmental institutions for decades. This change includes a shift in the regional economy from primarily manufacturing to service based. Changes in land use and development patterns are transforming the traditional visual character and function of the region, and there is an increased awareness of the role transportation plays in influencing regional growth and change. A regional land use plan is being developed concurrently with the RTP. It will recommend strategies in development and zoning that will discourage the use of automobiles and more importantly encourage the use of alternate modes of travel. The RTP was developed in coordination with the goals of documents like these and many others.

Several elements of strategic planning must be emphasized. First, strategic planning is a continuing process which not only produces planning documents, but an action agenda from which local decision-makers can work. Second, strategic planning is contingent upon the critically important input of the local chief elected officials, city and town staff, and the general public, a point of emphasis for this RTP update. Third, the strategic planning process is based on a realistic assessment of external forces—political, social, economic, and technological—that can affect Pioneer Valley communities and residents. Finally, actions that come from the strategic planning process must have a real potential for implementation.

By developing the RTP in such a manner, the region will be able to conduct twenty three years of successful transportation improvement programming through the year 2020.

CHAPTER 2

transportation planning process

A. REQUIREMENTS

Intermodal Surface Transportation Efficiency Act (ISTEA)

On December 18, 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA) was signed into law. ISTEA establishes the financial structure for transportation improvements through September 30, 1997 by setting the upper limits for federal funding of transportation planning, construction, maintenance and support. These thresholds do not necessarily determine what will be spent, but rather establish the maximum that may be spent in a given year. The actual dollar amounts are negotiated each year by Congress through an appropriations bill.

Several fundamental and unprecedented changes in the transportation planning process were introduced in ISTEA. First, in a move to incorporate more regional and local involvement in transportation planning, ISTEA shifts a share of the responsibility for prioritizing transportation projects from State Transportation Agencies to Metropolitan Planning Organizations (MPOs). The MPOs, in turn, look to municipalities to set local priorities. This shift is intended to give the MPOs and municipalities a stronger voice in planning transportation improvements which directly affect them, as well as to facilitate greater integration and coordination of their efforts with those of the state.

Second, in contrast to previous transportation legislation, ISTEA establishes specific requirements for transportation planning. Sixteen factors that MPOs must consider when developing or implementing transportation plans or programs are outlined in Chapter 4.

ISTEA has additional requirements for the preparation of long-range transportation plans:

- forecasting/planning for at least a twenty year time period;
- financial planning that demonstrates how the long-range plan will be implemented;
- assessing capital investment and other measures necessary to both preserve the existing transportation system and ensure its maximum efficiency; and
- indicating, as appropriate, proposed transportation enhancement activities (such as the construction of bicycle and pedestrian facilities or the establishment of safety programs).

Finally, in an effort to enhance efficiency and longevity of the existing transportation infrastructure, ISTEA encourages states to develop, establish, and implement a system for managing each of the following:

- Pavement of federal-aid highways;
- Bridges on and off federal-aid highways;
- Highway safety;
- Traffic congestion;
- Public transportation facilities and equipment; and
- Intermodal transportation facilities and systems.

These management systems were originally required by the ISTEA legislation and were developed and implemented by the state in cooperation with Metropolitan Planning Organizations. Since then, new legislation has made the management systems optional with the exception of the Congestion Management System, which is still required in all metropolitan



areas with populations of 200,000 or more. Under ISTEA, these large urbanized areas are designated as Transportation Management Areas (TMAs). The regional congestion management system identifies existing areas of traffic congestion and promotes strategies and projects to alleviate this congestion. Further, in TMAs classified as "non-attainment" under federal emission standards, the new legislation prohibits the use of federal funds for any highway project that will result in a significant increase in carrying capacity for single occupant vehicles, unless the project is part of an approved congestion management system. The Pioneer Valley region has been designated as a Transportation Management Area and is considered a non-attainment area with regard to air quality.

Clean Air Act Amendments of 1990

As a result of federal clean air legislation, the Regional Transportation Plan must include a complete analysis of air quality issues in the region, along with demonstrations of how this plan will work to achieve National Ambient Air Quality standards. Further, it must include short and long range transportation plans and projects indicating the future direction of the transportation system. The degree to which the short and long range plans are discussed is essentially the option of the organization(s) preparing the plan. It is important to note, however, that it is necessary for transportation projects/plans to be included in a Regional Transportation Plan, if they are to receive federal funding for implementation. It is also important to note that ISTEA is the funding source for implementing transportation measures identified in the Clean Air Act Amendments.

B. PARTICIPANTS IN THE TRANSPORTATION PLANNING PROCESS

A variety of public and private entities are involved in the Transportation Planning Process. A summary of these organizations and their responsibilities follows.

Municipalities

The Pioneer Valley Region consists of 43 incorporated cities and towns. Each has a large responsibility to provide local transportation facilities and services. As a result, a significant portion of each local budget is expended for transportation purposes. Communities also receive state funds, called Chapter 90, for transportation purposes. Some of these local responsibilities and/or expenditures include:

- Initiation of federally assisted projects for roadways not under state jurisdiction;
- Support for public transit by more than half of the region's 43 municipalities that are members of the Pioneer Valley Transit Authority (PVRTA);
- Contribution by some rural municipalities to special, local paratransit services in their towns; and,
- Provision of school transportation, public service vehicles (such as police, fire and, in some areas, trash removal), local traffic regulation, and road and sidewalk maintenance by all municipalities in the Pioneer Valley Region.
- Seasonal maintenance of local roadways (snow, etc.);

To provide a well-maintained and efficient transportation network for the Pioneer Valley region, it is important that the municipalities adopt suitable plans, policies, and programs for guiding future transportation and land use improvements in their areas; and that these municipal plans and programs be coordinated with regional planning efforts.

The Pioneer Valley Metropolitan Planning Organization (MPO)

The Pioneer Valley Metropolitan Planning Organization, comprised of four signatory members, implements and oversees the 3C transportation planning process in the Pioneer Valley region. The objective of the 3C transportation planning process is to assist, support, and provide the capability to maintain an open comprehensive, cooperative, and continuing

transportation planning and programming process at all levels of government in conformance with applicable federal and state requirements and guidelines. The members of the MPO include two regional agencies, the Pioneer Valley Planning Commission (PVPC) and the Pioneer Valley Transit Authority (PVTA), and two state transportation agencies, the Executive Office of Transportation and Construction (EOTC) and the Massachusetts Highway Department (MHD). These four agencies are referred to as the "signatories" to the MPO.

The MPO approves and adopts the Regional Transportation Plan for the region, as well as the annual Transportation Improvement Program (TIP) and other transportation planning documents. In addition, the MPO approves the annual work program for transportation planning, and receives policy recommendations from the Joint Transportation Committee (JTC). Each of the four MPO members reviews regional transportation documents/plans and, if acceptable, indicates its acceptance by endorsing the document. Endorsement by majority decision is necessary for the MPO, as a whole, to grant approval. This strategy ensures that both state and regional entities are brought together to participate in a comprehensive, continuing, and cooperative transportation planning process for the Pioneer Valley region.

Pioneer Valley Planning Commission (PVPC)

The Pioneer Valley Planning Commission serves as the comprehensive regional planning agency for the 43 cities and towns of Hampshire and Hampden Counties in Western Massachusetts. It is one of the four signatory bodies to the region's Metropolitan Planning Organization (MPO) and is responsible for guiding growth and development (both physical and economic) in the Pioneer Valley. In its role as the lead planning agency for the MPO, PVPC provides the staff to conduct MPO and other transportation planning activities for the Pioneer Valley. Transportation planning funds come from many sources including, its member communities, the Federal Highway Administration, the Federal Transit Administration, the Massachusetts Highway Department, the Massachusetts Executive Office of Transportation and Construction, and the Pioneer Valley Transit Authority, among others.

Pioneer Valley Transit Authority (PVTA)

The PVTA is the regional transit authority in the Pioneer Valley. Like PVPC, it is also a signatory agency to the region's MPO. The Pioneer Valley Transit Authority provides transit services and some special paratransit services to 23 cities and towns in the region through contracts with two operators (UMass Transit, and Transit Express) and multiple paratransit operators.

The PVPC provides a significant amount of planning support to the PVTA through a contractual agreement. Further, PVPC includes transit improvement projects in the Transportation Improvement Program (TIP) and in the Regional Transportation Plan (RTP), both of which serve as guides for determining future facilities and service improvements of the PVTA. PVTA receives funds from the Federal Transit Administration, the Massachusetts Executive Office of Transportation and Construction, its member communities and passenger fares.

Executive Office of Transportation and Construction (EOTC)

The Executive Office of Transportation and Construction represents the third signatory to the MPO. Similar to the Department of Transportation (DOT) on the federal level, this state agency is, in general, responsible for coordinating all state transportation planning and construction. Housed within the EOTC are a number of state agencies, including the Bureau of Transportation Planning and Development (BTP&D) and the Massachusetts Highway Department, that plan and implement actual transportation improvements. The BTP&D prepares the annual State Transportation Improvement Program (STIP) which is submitted to the Federal Highway Administration and the Federal Transit Administration for approval and funding.

Massachusetts Highway Department (MHD)

The Massachusetts Highway Department is the fourth signatory to the MPO. This department is directly involved with the Commonwealth's highway system and is responsible for engineering and implementing highway-related projects.

Joint Transportation Committee (JTC)

The JTC is a committee comprised of representatives of local, regional and state governments, as well as private groups and individuals involved in providing transportation facilities, services, and/or planning (including Peter Pan Bus Lines, Inc., Pioneer Valley Railroad, and Westfield Airport).

The JTC was established by the 3C Memorandum of Understanding for the purpose of incorporating citizen participation in the transportation planning process. It is intended that the JTC be representative of both public and private interests in the region and provide a forum for reviewing and offering comments and recommendations to guide transportation planning and transportation improvements in the region. The JTC also serves in an advisory capacity to the MPO in their decision to accept and endorse a plan or project. The JTC plays a key role in reviewing documents such as the Regional Transportation Plan, the annual Transportation Improvement Program and the Unified Transportation Work Program.

Department of Environmental Protection (DEP)

The Clean Air Act Amendments of 1990 require all states that do not meet federal air quality standards to prepare a State Implementation Plan (SIP) identifying specific strategies for achieving National Ambient Air Quality standards. The Commonwealth of Massachusetts is considered a non-attainment area, meaning that it does not meet the established air quality standards. The lead organization in preparing the required SIP is the Department of Environmental Protection. DEP monitors the air quality status and recommended improvement strategies (by region) from the Commonwealth's thirteen (13) Regional Planning Agencies. This information is then used to prepare a statewide strategy for meeting federal air quality standards. Preparation of the SIP is conducted periodically.

Additional State Programs

In addition to federal funds made available by ISTEA, the state spends a large portion of its own available funds on transportation improvement projects. All federal funds received by the Commonwealth for transportation projects must be supplemented with a state match (usually 80% federal/ 20% state ratio). The state also provides assistance to municipalities for some local street improvements, as well as providing funding assistance for mass transit, school transportation, and special paratransit services. In order to provide these funds, the Commonwealth's Legislature enacts a transportation bond bill periodically. In each Transportation Bond, funds are appropriated to communities based on a formula under the provisions of MGL Chapter 90, section 34. These funds are commonly known as Chapter 90 funds. The Chapter 90 highway formula is comprised of three variables: local road mileage (58.33 percent), employment figures (20.83 percent) and population estimates (20.83 percent). Under this formula, those communities with a larger number of road miles receive proportionately more aid than those with fewer road miles. Transportation Bonds have also earmarked funds for the design and/or construction of specific projects. Funding for these projects has occurred at the discretion of the legislature.

Massachusetts Turnpike Authority

Funded entirely through tolls administered by the Massachusetts Turnpike Authority, the Massachusetts Turnpike is aligned along the entire width of the Pioneer Valley from east to west.

Metropolitan District Commission (MDC)

The state's Metropolitan District Commission owns and maintains roads on its lands, which in this region lie primarily in the vicinity of the Quabbin Reservoir.

Federal Agencies

The federal government and its various agencies develop national transportation policies and are the principal funding source for many transportation improvements. Most federal activity is exercised through agencies of the US Department of Transportation (DOT), but the US Department of Health and Human Services (HHS) also provides some transportation assistance, predominantly paratransit funding.

Department of Transportation (DOT)

The US Department of Transportation administers and coordinates highway, transit, air, and rail planning at the federal level in addition to a substantial number of assistance programs to state and local governments. Specific activities (typically broken down by mode) are handled by individual federal agencies housed within the Department of Transportation. These agencies include the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Federal Aviation Administration (FAA), the United States Coast Guard (USCG), the Surface Transportation Board (STB) and the Federal Railroad Administration (FRA).

The Federal Highway Administration (FHWA) is responsible for allocating federal funds for the planning, construction, maintenance, and management of many of the nation's highways and bridges. ISTEA changed both the highway funding classifications from Primary, Secondary and Urban Systems to Interstates, National Highway System (NHS) and Surface Transportation Program (STP). ISTEA also established the Congestion Mitigation/ Air Quality and Bridge funding programs.

The Federal Transit Administration (FTA) is the primary federal funding source for planning and implementing mass transportation improvements. FTA provides financial assistance for both urban and rural mass transportation, and subsidizes some paratransit services for non-profit organizations. Both capital and operating funds are made available.

The Federal Aviation Administration (FAA) provides funding assistance for airport planning and construction, as well as for air traffic control, establishment of safety standards and inspection of accidents.

The Federal Railroad Administration (FRA) is a regulatory body concerned with safety issues related to rail traffic. The FRA is responsible for investigating rail accidents, but also works to develop and implement programs to promote safe rail operation.

Department of Health and Human Services

The Department of Health and Human Services assists service agencies in their effort to provide transportation for the elderly, medical services, and community service operations. Most of these are paratransit services.

Other Transportation Planning and Service Organizations

In addition to the many local, state, and federal government agencies involved in transportation planning and improvements, other public and private organizations are also important to the operation and improvement of transportation facilities and services in the Pioneer Valley region. A number of social and human service agencies in the Pioneer Valley region operate paratransit service. Although some of these operators receive federal assistance, many are privately operated and funded.

Amtrak is the primary provider of intercity passenger rail service. No commuter rail is offered for inter-regional commuters to areas like Hartford and Boston.

Conrail is the largest rail freight operator in the region. Their services, in fact, cover much of the eastern portion of the US. Several short line railroads also operate freight service within the region.

Many associations of transportation service providers, such as the American Trucking Association (ATA) or the Massachusetts Railroad Association (MRA), are working within federal and state legislation to enact changes that have the potential to impact transportation planning and the focus of transportation improvements.

Pursuant to the goals of ISTEA, transportation planning in the Pioneer Valley has been very successful in involving business leaders, environmentalists and developers. Efforts like the *Plan for Progress* and the *Regional Land Use Plan*, described in Appendix A, bring these new partners to the transportation planning table.

C. KEY PRODUCTS

Regional Transportation Plan

The ISTEA legislation emphasizes the development and use of the Regional Transportation Plan (RTP) in the planning process. The RTP is envisioned to be the central mechanism for structuring effective investments to enhance overall transportation efficiency. ISTEA proposes regulations to strengthen the RTP by requiring a dynamic, updated framework of the region's transportation system to assist in decision-making regarding future transportation improvements.

The RTP is required to address both long range and short range needs. Both the short and long range elements identify transportation systems conditions such as demand, capacity, deficiencies, improvement alternatives, financial constraints and environmental benefits. The long range element addresses at least a twenty year planning horizon while the short range element addresses a three to five year horizon.

The RTP is scheduled to be updated at least every three years in non-attainment areas and every five years in attainment areas. This schedule ensures that the plans maintain validity and consistency with current and forecasted transportation and land use conditions and trends. ISTEA also requires adequate opportunity for public official and citizen involvement in the development of the RTP. A public participation plan is to be published and available for comment. The RTP in draft and final form must be readily available for public review and comment.

Transportation Improvement Program

The Transportation Improvement Program (TIP) is the central management tool for financing transportation programs and projects. The TIP is to be fully consistent with the RTP and the planning process. In developing the TIP, the actions identified must conform with the goals, policies and objectives of the RTP. Updated annually, the TIP identifies a three year prioritized listing of projects for implementation that are consistent with expected funding levels available. Conformity to environmental regulations is key in determining the feasibility and priority of projects. Environmental analysis will also assist in identifying the funding source of projects based on federal restrictions. The TIP is also subject to the same public participation process as is required of the RTP by ISTEA.

Chapter 3

planning process

When considering any regional transportation planning activity, like the RTP, it is imperative to examine demographic trends, land use development, employment patterns and the regional economy. All of these social and economic elements affect transportation.

Here in the Pioneer Valley region these changes are of particular importance. Located in Western Massachusetts, the Pioneer Valley is the fourth largest metropolitan area in New England with a population of 602,878. The Valley covers 1,178 square miles which is roughly equal in size to the State of Rhode Island.

Springfield, the third largest city in the state, is home to many of the region's largest employers, while the cities of Holyoke and Chicopee were among the first planned industrial communities in the nation. Much of the region's traditional manufacturing base is gone, but the Valley is left with a historical legacy of empty mill space and abandoned railroads. Finding new uses for this infrastructure, which reflect the current needs of the region, is an important aspect of our transportation planning. For example, slowing down the sprawl of land development by re-using urban spaces will encourage people to live closer to work. At the same time, turning these buildings into viable spaces in the existing population centers will reduce auto-dependency, decrease auto emissions, and ultimately improve air quality in the region. Converting our dormant rails into multi-purpose trails will allow commuters to walk or bicycle to work. All of these approaches were not traditionally considered transportation planning, but in the future, will benefit the region considerably.

A bit farther north of our urban centers, the communities of Amherst, Northampton and South Hadley are collectively known as the "five-college community." Including Amherst College, Hampshire College, Mount Holyoke College, Smith College and the University of Massachusetts at Amherst, the Pioneer Valley region has over twelve colleges, and more than 40,000 college students. This large student population is a strong market for alternative modes of transportation, including multi-use paths and transit.

By looking at all of our different historic, geographic and demographic characteristics, we can explore new possibilities in transportation planning. The Pioneer Valley Planning Commission maintains a comprehensive library of reports, data sources, and other documents which examine these characteristics. You will also find us on the World Wide Web at <http://www.pvpc.org>. For more specific information about regional demographics, economics, land use, transportation or any additional topic, please reference one of the following publications.

- A Determination of the Economic Contributions of Westover, Barnes and Bradley Airports to the Pioneer Valley Region (July 1994)
- A View of Our Valley: Employment and Income (1994)
- A View of Our Valley: Market Trends (1994)
- A View of Our Valley: Population (1994)
- A View of Our Valley: Transportation (1994)
- Community Profiles (1997)
- Employment Projections for the Pioneer Valley (1995)
- Facility Profiles (1997)
- Forging a Link Between Land Use & Transportation Planning in the Pioneer Valley Region (February 1995)
- Major Employers of the Pioneer Valley (1995)

- Profiles of Select Economic Development Organizations Serving the PVPC (1997)
- The Connecticut River 2020 Strategy: Parts I and II (1993, 1995)
- The Plan for Progress: Economic Strategies for the Pioneer Valley (1994)
- VMT (Vehicle Miles Traveled) Reduction Workbook (September 1995)

Appendix A contains a compilation of executive summaries from some of these works and others that contain pertinent transportation information.

The following maps depict the regional highway, transit, bikeway and intercity bus systems respectively.

Figure 1
**Pioneer Valley Region
 HIGHWAYS**

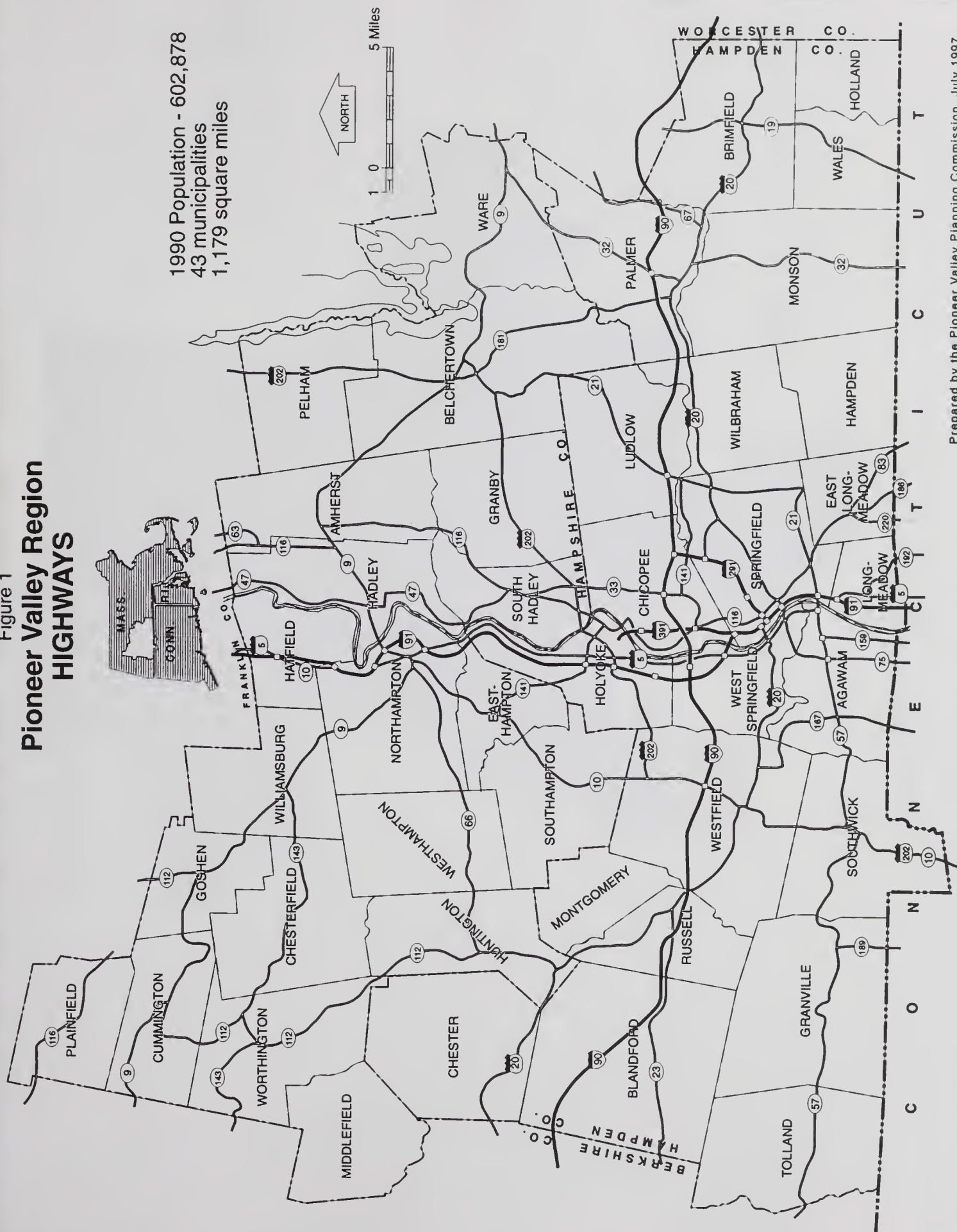


Figure 2

PVTA Fixed Transit Routes

Fixed Transit Route
 PVTA Member Municipalities

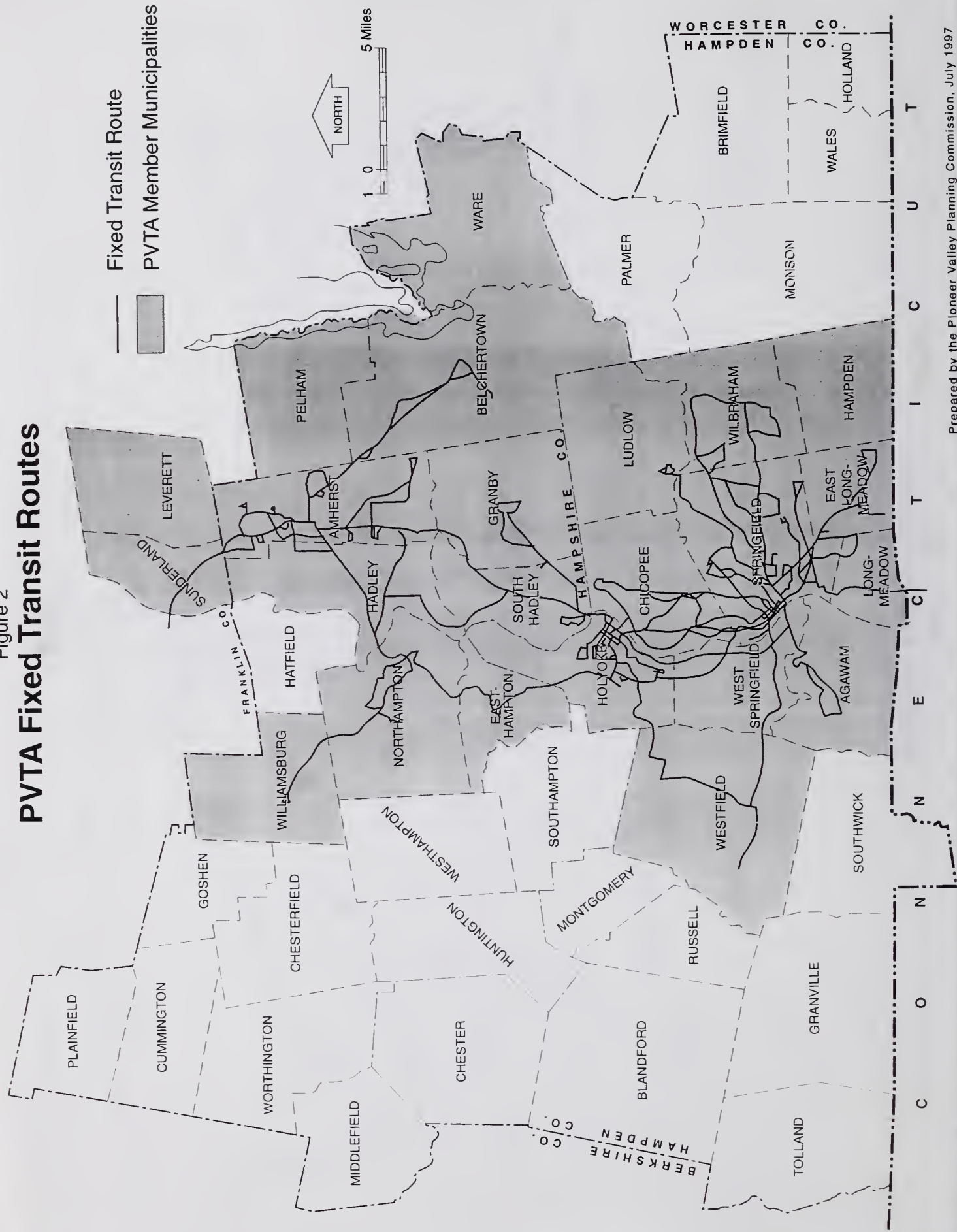
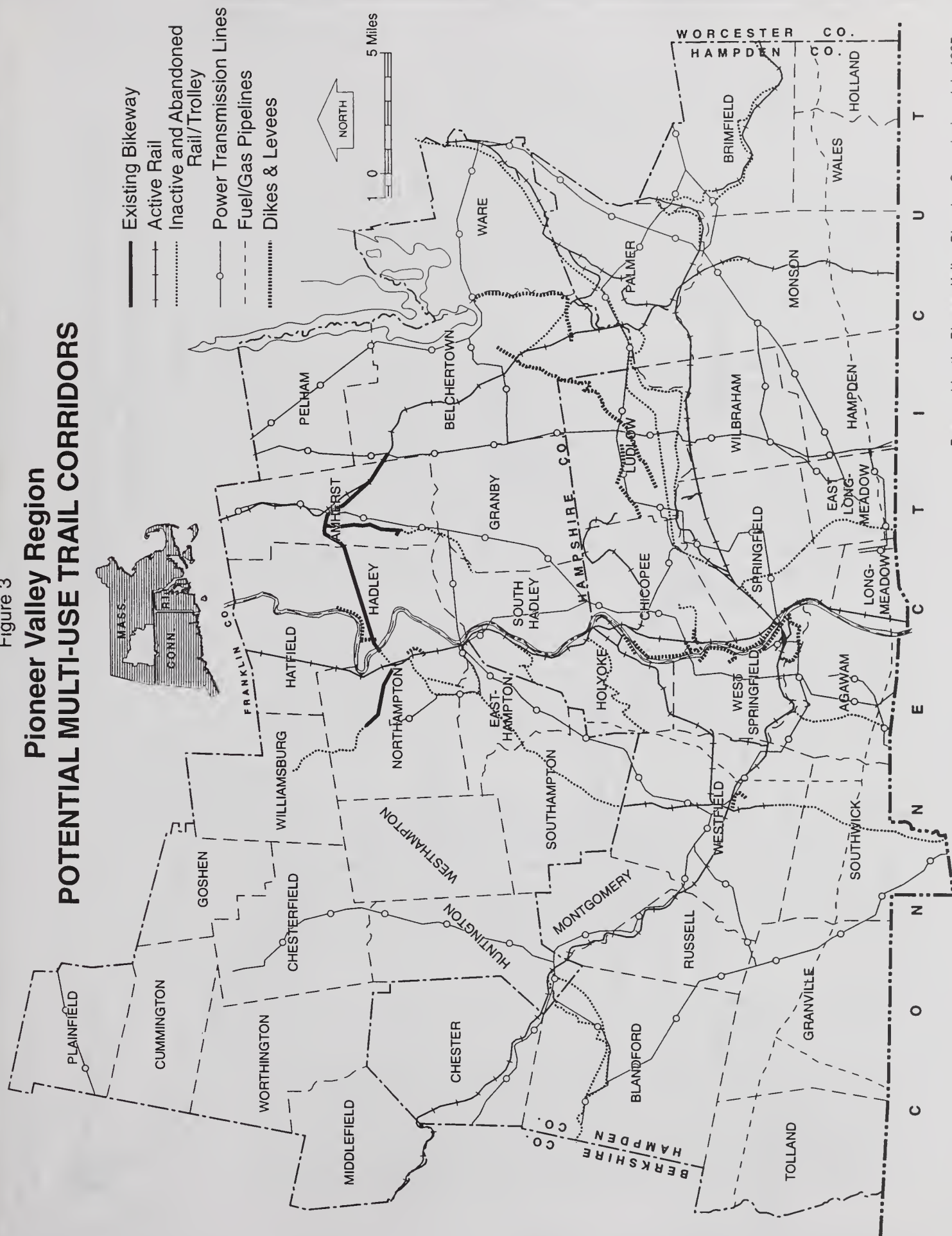


Figure 3

Pioneer Valley Region POTENTIAL MULTI-USE TRAIL CORRIDORS



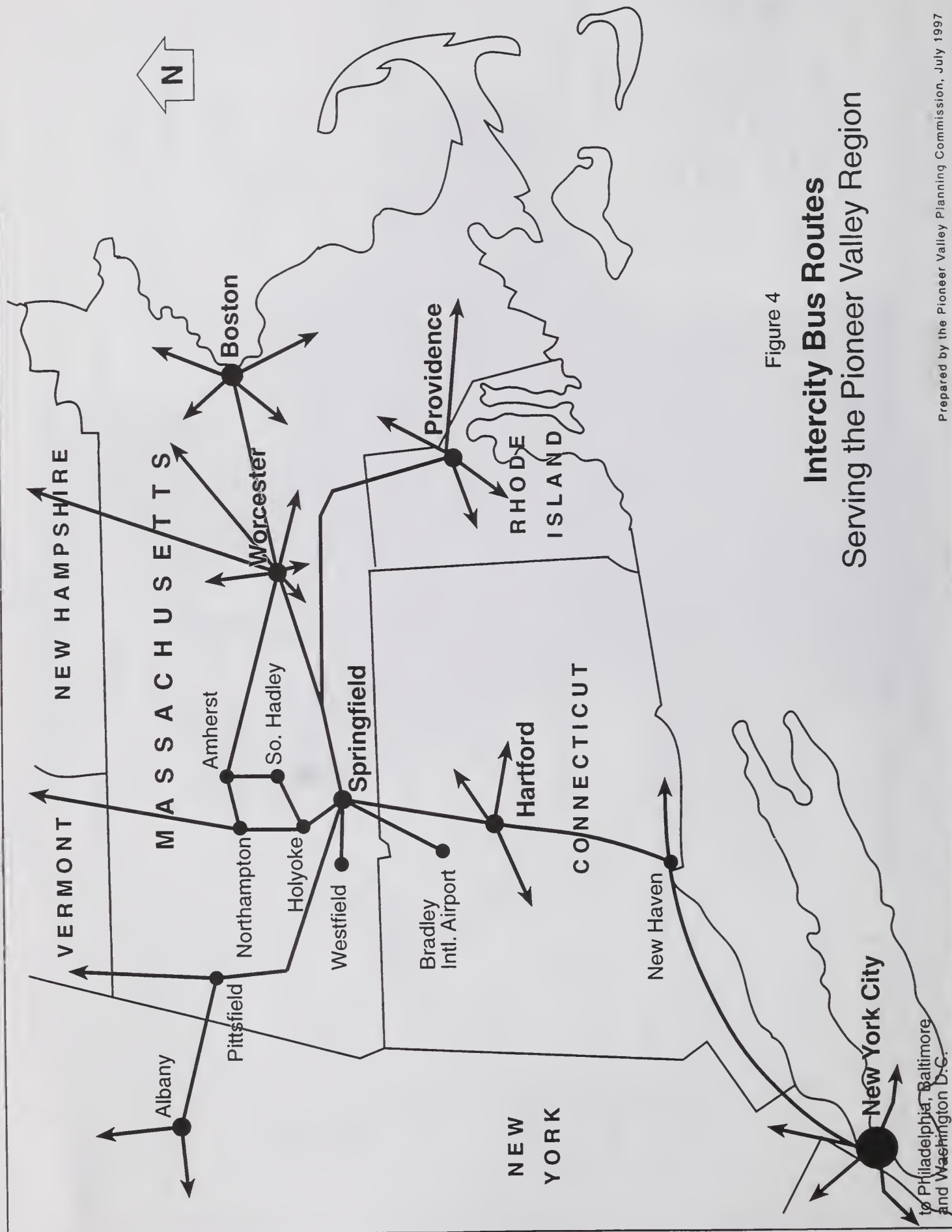


Figure 4

Intercity Bus Routes Serving the Pioneer Valley Region

CHAPTER 4

the sixteen factors of ISTEA

In the development of transportation plans and programs, ISTEA requires all metropolitan planning organizations to incorporate sixteen factors of consideration into their respective planning processes. By including the consideration of these factors, the Pioneer Valley Regional Transportation Plan and the planning process within the region are consistent with the objectives of ISTEA. This section addresses each factor separately and shows how the planning process within the Pioneer Valley has incorporated each factor.

FACTOR #1

Preservation of existing transportation facilities and, where practical, ways to meet transportation needs by using the existing transportation facilities more efficiently.

Preserving and maximizing the efficiency of the transportation infrastructure has been identified as a high priority in the Pioneer Valley planning process. A pavement management system has been aggressively implemented in the Pioneer Valley to ensure that federal aid roadways are maintained in the most cost effective and efficient manner. Many communities in the region have enlisted planning commission assistance in the establishment of a local pavement management system in order to efficiently maintain all community roadways. Another form of infrastructure preservation are the efforts within the region to preserve abandoned rail corridors and tow path canal beds. Maintaining the continuity of these right of ways for future transportation uses will be emphasized in the years to come, especially in the implementation of the regional non-motorized transportation plan.

Further consideration of Factor #1 is exhibited in the TIP project prioritization process itself. To attain high priority in a specific element year of the TIP, proponents must show an analysis of all applicable alternatives to their project. The merit of a project weighs heavily on whether it will maximize system efficiency in the area where it was designed to improve the transportation infrastructure. The regional congestion management system, as well as corridor and transit route studies, provide the mechanism for alternative improvement analyses.

FACTOR #2

The consistency of transportation planning with applicable Federal, State, and local energy conservation programs, goals, and objectives.

Many of the programs designed to reduce vehicle miles traveled and overall emissions are inherently compliant with Factor #2. Travel demand management initiatives, land use strategies, and non-motorized transportation programs are all included in the RTP and will play a vital role in the energy conservation efforts in the region. In addition, the PVTA has experimented with alternative fuel vehicles and the regional long range plans include the continuation of these efforts.

FACTOR #3

The need to relieve congestion and prevent congestion from occurring where it does not yet occur.

Numerous activities and objectives outlined in the RTP concentrate on relieving and preventing traffic congestion. The Regional Congestion Management System (CMS) provides the best example of how the planning process addresses this issue. The CMS is a tool used by planners to rate both current and future transportation system deficiencies and prioritize the projects to alleviate these deficiencies. Using computer models, on board transit surveys, corridor studies, and local input, the CMS is able to pinpoint where limited transportation funding can be most effectively applied. Congestion relief is one of four main criteria used in prioritizing projects on the TIP.



The CMS is now at a stage where it is developing strategies and projects that will be incorporated into the RTP and TIP to alleviate congestion problems. Over thirty locations have already been cited as having moderate to serious traffic delay problems. The CMS staff, with the input from local officials and model results, are planning projects that will mitigate identified areas of congestion.

FACTOR #4

The likely effect of transportation policy decisions on land use and development and the consistency of transportation plans and programs with the provisions of all applicable short and long-term land use and development plans.

Since the inception of ISTEA, the interrelationship between transportation and land use has continually grown stronger within the Pioneer Valley Region. All corridor studies contain comprehensive land use analyses. In addition, a planner workbook has recently been developed to assist local zoning boards and planners to control land use development to minimize vehicle miles traveled. With the integration of a land use component into regional transportation modeling, planners in the region will continue to strengthen the bond between land use and transportation. The Regional Non-motorized Transportation Plan was developed through the cooperation of land use and transportation planners.

Efforts are now underway to formulate a regional land use plan for the Pioneer Valley. Ultimately, the plan calls for the establishment of a regional land use management system. This planning tool will allow regional planners to assist local planners to develop and zone their community with a more regional approach in mind. Both the land use plan and the management system will be fully integrated into the transportation process with the goal of reducing the need for automobiles.

FACTOR #5

The programming of expenditure on transportation enhancement activities as required in Section 133 of ISTEA.

The Pioneer Valley region has placed a very high priority on the enhancements program. The MPO approved a set aside of both federal and state funds for the express purpose of funding enhancements projects. Over the past several years, this program has generated many important initiatives. One initiative is the revitalization of the Connecticut River Walk and Bikeway Project, which will encourage people to bicycle instead of using their automobiles, and at the same time induce economic development that will help bring the region into the next century.

FACTOR #6

The effects of all transportation projects to be undertaken within a metropolitan area, without regard to whether such projects are publicly funded.

All projects identified in the RTP are analyzed to measure their effects on mobility, vehicle miles traveled, and air quality. The primary tool to complete this analysis is the regional travel demand model. By comparing future improvements to a no build scenario, all projects can be tested on how they effect the performance of transportation infrastructure. The Massachusetts Environmental Protection Act (MEPA) project review process provides an opportunity for planners to review and comment on all public or private developments.

FACTOR #7

International border crossings and access to ports, airports, intermodal transportation facilities, major freight distribution routes, national parks, recreation areas, monuments and historic sites, and military installations.

Though not all of the ISTEA factors can be applied to this region, access to these critical areas remain a high priority within the planning process. The intermodal management system will

play a vital role in maintaining intermodal facilities as well as access to these facilities ensuring that the flow of goods and people will remain efficient. The transit and paratransit systems, and the network of non-motorized facilities, are designed to create easy access to parks and other areas of interest.

FACTOR #8

The need for connectivity of roads within the metropolitan area with roads outside the metropolitan area.

Several projects exhibit this regional emphasis on connectivity. Most notable are the Skyline Trail project, the Hartford Metropolitan Area Intelligent Transportation Systems (ITS) early deployment program and the Pioneer Valley Non-motorized Transportation Plan. The Skyline project encompassed five communities spanning two planning regions and three counties. The project assessed current conditions, provided a profile of improvement needs, and outlined the planning process in order to show the communities how to secure funding for road improvements. The ITS project being conducted by the Hartford Region has opened a line of communication between the respective MPOs to maintain a constant exchange of information. In the upcoming months, the Commonwealth, PVPC, and a private consultant will be conducting an ITS Early Deployment Plan within the Pioneer Valley. By coordinating improvement programs, the two regions continue to preserve the connectivity of common roadways. The Non-motorized Transportation Plan incorporates on and off road bike way connections with other regions and the State of Connecticut.

FACTOR #9

The transportation needs identified through use of the management systems required by ISTEA.

The bridge, public transportation, and safety management systems are being developed by state government officials with regional involvement and input. The congestion, pavement, and intermodal management systems have been established and are currently being conducted by the planning commission under contract with the state. All findings of the management systems will be considered for inclusion in the RTP. As mentioned earlier, the CMS is now at the stage where actual projects are being generated from congestion mitigation and alleviation strategies. The regional pavement management system will be instrumental in estimating future highway maintenance and operation needs.

FACTOR #10

Preservation of rights-of-way for construction of future transportation projects, including identification of unused rights-of-way which may be needed for future transportation corridors and identification of those corridors for which action is most needed to prevent destruction or loss.

Preservation is a top priority within the Pioneer Valley and is encouraged by the MPO. Both communities and the planning commission have attempted to obtain rights-of-way with mixed results. Although policies and objectives exist on a regional level, neither the process of procurement nor the funding has been established by the state for preservation efforts. The enhancements program has also preserved facilities. The Hazardville and Manhan rail lines are good examples of preserving facilities through this program.

FACTOR #11

Methods to enhance the efficient movement of freight.

Freight movement efficiency relies heavily on private sector participation. Since many freight facilities are privately owned, improvement via public sector interaction is challenging and oftentimes inappropriate. Through the implementation of the Intermodal Management System, access to major freight facilities from the National Highway System (NHS) will be added to the NHS itself, making these roadways eligible for a wider range of funding opportunities.

This arrangement will also make it easier to improve access roads to intermodal facilities, which is another step in improving the movement of goods. A project in Westfield, which appears on the current regional TIP, will assist in the flow of goods in that community by adding a span across the Westfield River and increasing the clearance under two Conrail-owned railroad bridges.

FACTOR #12

The use of life-cycle costs in the design and engineering of bridges, tunnels, or pavement.

Life-cycle costing is required for all projects included in the regional TIP. Roadway reconstruction and resurfacing cost analysis is taken into account in the pavement management system process. The pavement management system provides local decision makers with the information they need to maintain acceptable roadway pavement conditions, based on condition, cost, life of repair, and benefit to users.

FACTOR #13

The overall social, economic, energy, and environmental effects of transportation decisions.

The RTP update and the planning process in the Pioneer Valley address these issues in many different ways. In addition to addressing air quality, which has many social, economic, and environmental ramifications, the RTP examines issues like stormwater run-off, economic growth and land use. The resolution of these issues brings the total dependence of our everyday life on the transportation infrastructure to the forefront. Decisions regarding future transportation improvements will reflect these issues.

FACTOR #14

Methods to expand and enhance transit services and to increase the use of such services.

Several initiatives have been established and will continue to expand and enhance transit service in the region. As operating subsidies dwindle, however, the job at hand grows more difficult. Recently redesigned transit routes targeting the minimization of passenger ride time has improved ridership significantly without drastically changing overall operating expenses. The region has made a substantial effort to flex highway funding like Congestion Mitigation/Air Quality funding into transit uses.

FACTOR #15

Capital investments that would result in increased security in transit systems.

Safety and security in public transit systems is fast becoming a major issue through out the nation. New system design in the Pioneer Valley has placed a premium on security at newly implemented transfer centers. These centers will be well lit, include amenities, and have quick response incident management systems. The PVTa is also in the process of implementing an automated vehicle locator system that will allow the central dispatch to keep track of the entire service fleet in real time. A new initiative creating a link between bicycle and transit use, includes the provision of installing secure bicycle parking facilities at strategic locations.

FACTOR #16

Recreation travel and tourism.

As part of regional Connecticut River riverfront revitalization efforts, the Pioneer Valley has set forth an initiative through the enhancements program to establish a tourist information center in Springfield. The facility would be part of the expansion at the Basketball Hall of Fame, and include access from I-91 as travelers enter the state from the south. This project is a prime example of regional efforts to incorporate recreational travel and tourism information in the transportation planning process.

CHAPTER 5

regional visions and goals

The Pioneer Valley Planning Commission developed a vision statement consistent with the sixteen factors of ISTEA and which provided a framework for our RTP.

VISION STATEMENT

The Pioneer Valley region strives to create and maintain a safe, dependable, and environmentally sound transportation system that promotes livable communities and provides for the efficient movement of people and goods.

GOALS OUTLINE

Safety: To provide and maintain a transportation system that is safe for all users and their property.

Operations: To provide and maintain a transportation system that is dependable and adequately serves users of all modes.

Environmental: To minimize the transportation related adverse impacts to air, land, and water quality and strive to improve environmental conditions at every opportunity.

Coordination: To collaborate the efforts of the general public with local, state and federal planning activities including project implementation, land use and economic development.

Energy Efficient: To promote the reduction of energy consumption through demand management techniques and increase the use of energy efficient travel modes.

Cost Effective: To provide a transportation system that is cost effective to maintain, improve and operate.

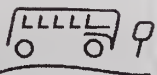
Intermodal: To provide access between travel modes for people and goods while maintaining quality and affordability of service.

Multimodal: To provide a complete choice of adequate travel options to all public and private users.

Economically Productive: To maintain a transportation system that promotes and supports economic stability and expansion.

Accessibility: To provide a multimodal transportation system that is accessible to all residents, visitors and businesses.

Quality of Life: To provide and maintain a transportation system that enhances our quality of life and improves the social and economic conditions throughout the region.



CHAPTER 6

development of the plan

The development of a long range transportation plan is a complicated process. It requires involvement from many people all with different interests, consideration of many modes, and understanding of the benefits and drawbacks of our decisions. The process undertaken here in the Pioneer Valley can be simplified into three distinct activities: public participation, conduction of management systems, and traffic modeling.

The Public Participation Process

The role of public participation should evolve into an avenue for working with residents and employers of the region to collaboratively build transportation programs. The Pioneer Valley is diverse in its demographics, economics and geography, resulting in varying transportation needs across the region. Finding effective avenues for reaching over 600,000 residents of forty-three communities in the Valley requires creativity and resources.

For the transportation planning process to be successful within the Pioneer Valley region, broad public involvement is needed. Traditionally, Pioneer Valley transportation plans and programs have been developed by involved agencies with community representation and then presented to the general public. The degree of public interaction and participation has been limited. Incorporating the ideas and interests of citizens has required a new approach to developing transportation plans. Citizens must be involved early on and continue participating throughout the process.

Much of the early participation for the RTP was accomplished through the development of other plans, programs, and studies. Corridor studies, management systems, land use plans and initiatives were all predicated upon the involvement of local elected officials and their constituencies. Public hearings and meetings for these activities are a prime source of ideas that are expanded while developing the RTP.

In addition to the outreach associated with these activities, the Pioneer Valley Joint Transportation Committee (JTC), the transportation advisory group for the region, plays a vital role in the development of the RTP. The JTC was established by the 3C Memorandum of Understanding, which emphasizes a comprehensive, cooperative and continuing process for transportation planning and programming. The JTC incorporates citizen participation into this commitment and was formed to represent both public and private interests in the region. It consists of individuals from local, regional and state government and private groups and individuals who provide transportation facilities, services or planning for the Pioneer Valley region. The JTC is also charged with the coordination of all transportation-related projects throughout the planning district. The planning program and the various functional elements of the planning process must be reviewed by the JTC prior to action by the Metropolitan Planning Organization (MPO).

The development of the 1997 Update to the RTP depended heavily upon a series of public forums. Held in Amherst, Northampton, Palmer, Holyoke, Springfield and West Springfield, these forums allowed planners to discuss transportation issues with interested citizens, city councilors, local planners, and business leaders.

The Management Systems

Recommended by federal legislation, the six management systems are tools with which planners maintain, organize and evaluate data about certain aspects of our transportation infrastructure: congestion, bridge, safety, public transportation, intermodal, and pavement. Con-

gestion, pavement and intermodal, are conducted in the region by the planning commission while the other three systems are conducted by the state with regional participation. By utilizing the data from each management system, deficiencies in the transportation infrastructure are pinpointed and prioritized.

The Congestion Management System (CMS) is an ongoing transportation planning activity directed at maximizing the mobility of people and goods. The CMS accomplishes this goal through a variety of tasks which identify existing and projected locations with traffic congestion and develops strategies to alleviate and better manage traffic operations in these problem areas. Congested locations are typically characterized by excessive travel delay, large vehicle queues and traffic bottlenecks causing driver frustration and poor traffic operations. The CMS evaluates the existing federal aid transportation system performance and proposed strategies to aid in project and strategy implementation. Products of the CMS are suggested projects and strategies that increase the mobility of people and goods through improvements to the transportation infrastructure and changes to travel behavior. The CMS serves as a guide and technical support for local, regional and state officials in making decisions related to investments in congestion relief projects and programs in a specific area.

A Pavement Management System (PMS) is a systematic process that collects and analyzes roadway pavement information for use in selecting cost-effective strategies for providing and maintaining pavements in a serviceable condition. ISTEA recommends that the PMS be developed in cooperation with the Metropolitan Planning Organizations (MPO) and other entities (like communities) receiving federal highway or transit funds. The PVPC's regional PMS involves a comprehensive process for establishing the network inventory and project histories, collecting and storing the pavement distress data, analyzing the data, identifying the network maintenance activities and needs and integrating the PMS information into the metropolitan and statewide planning processes. The roadway network covered by the regional PMS includes all urban and rural federal-aid highways of the 43 cities and towns in the region.

The Intermodal Management System (IMS) focuses on the connections between modes of travel for both people and goods. Since many of the intermodal facilities in the Pioneer Valley are privately owned and operated, the IMS has concentrated on the issue of access to these sites, especially for trucks. Many of the roads leading to these facilities have been added to the National Highway System, making them eligible for funding under the NHS program for reconstruction and/or expansion. This distinction is important and will go a long way in improving the efficiency of the intermodal facilities by maximizing their accessibility.

The other management systems target deficiencies in the inventory of bridges, transportation safety and transit rolling stock and other assets. As mentioned earlier, these systems are conducted on a statewide basis and offer future needs and strategies for inclusion in the RTP.

All management systems depend on public participation components. Local input is necessary to ensure that every possible deficiency in each specific area is included in the analysis.

Linking Land Use and Transportation

This RTP emphasizes the connection between transportation and land use, with substantial effort placed on a "land use management system." Using projected employment and population growth, an established plan outlines preferred development and land use patterns for the entire region. By strategically placing development, without limiting it, the region will maintain its economic vitality while taking a proactive approach to minimizing the dependence on the automobile.

Modeling

Developing a twenty year transportation plan requires foresight, making it necessary to forecast the future performance of the transportation system. This projection is best accomplished through the use of a traffic model. The entire roadway network is simulated and traffic volumes are applied to each segment according to population and employment projections for each traffic analysis zone. The model is then used as a tool in many aspects of RTP development, primarily, system deficiency identification, major improvement alternative analysis, and air quality conformity analysis. By simulating the effect of currently proposed improvement projects, the model indicates how the system performs after implementation. Using this system, new problem areas are identified and incorporated into the management systems and the RTP. Project priorities resulting from the management system analysis and local input are tested for viability with the traffic model. Once the effects of the newly planned improvements are simulated, a projected level of vehicle miles traveled aggregated for the entire region is generated and the consequential emissions can be calculated.

Intelligent Transportation Systems

In January of 1997, the BTP&D with the cooperation of the PVPC, solicited the assistance of a consultant to conduct an Intelligent Transportation Systems (ITS) Early Deployment Plan (EDP). The project is scheduled for completion in December of 1997 and will develop a plan of recommended ITS strategies and applications for the Pioneer Valley. These recommendations will ultimately be incorporated into future RTPs and TIPs.

There are currently 29 user services under the auspices of the ITS program. Everything from ramp metering and electronic toll payment to advanced traveler information systems and crash avoidance technology are all types of ITS applications. An ITS program can improve both the safety and operations of the transportation system and will be a priority for the Pioneer Valley in upcoming RTPs. Since the study has yet to be completed it is difficult to estimate the potential costs of implementing ITS application throughout the region. For the financial element of this plan the region has set aside 2.2 million dollars per year over the course of this plan. This amount will be re-examined in future updates of the plan.

Many ITS user services are predicated upon delivering "real-time" information to motorists.

A variable message sign (VMS) can be changed remotely and as shown here, provides up-to-date information regarding upcoming construction.



CHAPTER 7

needs and issues

The following sections of the RTP outline the needs, issues, strategies and actions for the next twenty years. For simplicity, they are organized by mode and are addressed with intermodal, environmental, and economic considerations as required by the goals of this plan and ISTEA.

A. HIGHWAY

1. Safety

Safety is a principal concern in most transportation plans and designs. Highway safety efforts focus on the reduction of traffic accidents and resulting deaths, injuries and property damage occurring on public roads. Included is passenger vehicle movement, truck conflicts, pedestrian and bicycle travel and bridge conditions.

Table 1
deficient bridge listing
with AASHTO rating

Town	Facility Over	Facility Under	Own by	Built Year	Recon.Year	AASHTO Rating*
Westfield	Pohassic St	PVRR/Access Rd	MA	1904	0	2
Williamsburg	ST 9 Goshen Rd	Mill River	MA	1910	1926	7.1
Westfield	US 202 S'wick Rd	Little River	MA	1951	0	7.7
Monson	Hospital Rd	Quaboag Stream	Town	1940	0	11.6
Montgomery	Carrington Rd	Roaring Brook	Town	1939	0	11.9
Chicopee	Depot St	Dwight Canal	City	1902	0	12.5
Belchertown	Cold Spring Rd	Swift River	Town	1920	0	14.6
Belchertown	Wilson St	NECRR	MA	1929	0	16.5
Chicopee	ST 116 Cabot St	CT River/PVRR	MA	1891	0	16.5
Westfield	US 20	Powder Mill River	MA	1932	0	16.6
Northampton	Old Springfield	Mill River	City	1940	0	17
Middlefield	Clark-Wright Rd	Glendale Brook	Town	1930	0	17.3
Northampton	Old Shepherd Rd	Mill River	City	1880	0	17.6
Westhampton	Stage Rd EXT	Manhan River	Town	1957	0	17.8
Brimfield	Monson Rd	Foskett Mill Stream	Town	1850	1939	18.3
Northampton	Drury Ln	Manhan River	City	1926	0	18.5
Monson	Hovey Rd	CONRAIL	MA	1890	1917	19.2
Cummington	Plainfield Rd	Westfield River	Town	1939	0	19.6
Williamsburg	Village Hill Rd	Mill River	Town	1965	0	20
Westfield	Granville Rd	Little River	City	1914	0	20.8
Chester	Smith Rd	Westfield River	Town	1887	1965	21.2
Granville	W. Hartland Rd	Hubbard River	Town	1939	0	22.5
Westhampton	Kings Hwy	Manhan River	Town	1938	0	23.9
Granby	Porter St	Bachelor Brook	Town	1956	0	24.4
Williamsburg	Old Goshen Rd	Mill River	Town	1938	0	24.4
Chester	Maple St	Westfield River	Town	1900	1928	24.5



Table 1 (cont.)
deficient bridge listing
with AASHTO rating

Town	Facility Over	Facility Under	Own by	Built Year	Recon.Year	AASHTO Rating*
Westfield	Northwest Rd	Little River	City	1887	1939	24.9
Palmer	US 20 Park St	ST 67	MA	1931	0	25.3
Holyoke	CONRAIL	Main St	MA	1978	0	26
Brimfield	Washington St	CONRAIL	MA	1890	1935	30.1
Chester	US 20	Sanderson Brook	MA	1910	1929	30.5
Ware	South St	PCRR	MA	1930	1979	30.9
Westhampton	Easthampton Rd	Manhan River	Town	1940	0	31.9
Holyoke	Sargeant St	First Level Canal	City	1850	1909	32.2
Easthampton	Glendale St	Manhan River	Town	1938	0	33.9
Holyoke	Jackson St	Second Level Canal	City	1850	1921	34.7
Palmer	US 20 Park St	CONRAIL	MA	1850	1931	34.7
Agawam	ST 57 EB & WB Spans	ST 159 Main St	MA	1958	0	35
South Hadley	Morgan St	Stony Brook	Town	1947	0	35.8
Chester	Hampden St	Walker Brook	Town	1940	0	36.5
Northampton	Bliss St	Mill River	City	1921	0	37.5
Springfield	Roosevelt Ave	CONRAIL	City	1930	1963	37.6
Agawam	ST 57 Ramp East	Other Utility	MA	1958	0	41
Springfield	Roosevelt Ave	CONRAIL	City	1930	1963	41
Springfield	Roosevelt Ave	Watershops Pond	City	1937	0	41.7
Easthampton	Torrey St	Manhan River	Town	1940	0	42.1
Chester	George Miller Rd	Westfield River	Town	1939	1963	42.6
Chester	Old MA Rd	Westfield River	Town	1910	0	42.8
Monson	Hampden Ave	Chicopee Brook	Town	1936	1938	42.9
Hatfield	Maple St	Bachelor Brook	Town	1941	0	43.2
Granby	Aldrich St	Mill River	Town	1938	0	44.5
Russell	Temp Access Rd	Westfield River	Town	1986	1928	45.2
Hadley	ST 9	Connecticut River	MA	1937	0	45.4
Northampton	ST 66 West St	Mill River	MA	1924	0	46
Chester	Blandford Rd	Walker Brook	Town	1939	0	46.9
Williamsburg	Skinnersville Rd	Mill River	Town	1955	0	47
Easthampton	ST 10 Northampton St	Manhan River	MA	1951	0	47.4
Holyoke	Lyman St	First Level Canal	MA	1921	0	47.8
Holyoke	ST 141 Appleton St	Second Level Canal	MA	1921	0	48.1
Ware	Hardwick Pond Rd	Muddy Brook	Town	1932	0	48.4
Westfield	US 20	Westfield River	MA	1932	0	49
Williamsburg	Ridge St	Mill River	Town	1918	1960	49.3
Southampton	ST 10	Manhan River	MA	1924	0	49.4
Westfield	Lockhouse Rd	CONRAIL	MA	1923	1975	49.4
Chester	Kinne Brick Rd	Westfield River	Town	1938	1960	49.5
Springfield	RAMP C	I 91-Ramp A'-US 5NB	MA	1954	0	49.7
Chicopee	ST 141 Montgomery St	Chicopee River	MA	1938	0	49.9

AASHTO - American Association of Highway & Transportation Officials (develops rating criteria)

Table 1 lists the bridges in the Pioneer Valley with an AASHTO rating below 50, all of which are structurally deficient and/or functionally obsolete. In addition to these bridges, there are another 147 bridges in the region that rate higher than 50 but are still classified as functionally obsolete or structurally deficient. It is estimated that at least 15 bridges must be rehabilitated per year if the system is to be maintained, translating into \$22.5 million in annual expenses.

One of the most significant social and environmental concerns related to the transportation of goods is that of hazardous materials and waste movement in the transportation network. Interstate highways I-90 and I-91, and the Conrail and B&M railroads are the primary east-west and north-south routes through Western New England. With the crossroads of both systems located within the boundaries of the Pioneer Valley, much of the hazardous materials and waste moving throughout Western New England passes through the Pioneer Valley region. This volume may increase significantly in the future if a proposal to establish a hazardous waste treatment facility in neighboring Franklin County (in Orange) is implemented. Given the current and potential volume of hazardous substances passing through the Pioneer Valley, the region has a significant interest in efforts to transport such substances safely and efficiently through the area.

2. Congestion

Table 2
congestion management
system findings
current and future needs

COMMUNITY	Location	LIMITS	STATUS
Agawam	Route 147 and Route 159	Rowley St to Federal St	Further Action Req.
Agawam	Route 75	Mill St to Rte 159 & Rte 147	Further Action Req.
Agawam	Route 57	Poplar St to Rte 187	TIP Project
Agawam/Spfld	Route 5 (Julia B. Buxton Br.)	Souht End Br. Incl. Access Ramps	TIP Project
Chicopee	Prospect Street	Rte 116 to Buckley Boulevard	TIP Project
E. Longmeadow	Route 83	Harkness Ave to Dearborn St	Study Planned
E. Longmeadow	Downtown Rotary	Seven Leg Rotary	Study Planned
Had./Northampton	Rte (Calvin Coolidge Br.)	Bay Rd to Damon Rd	TIP Project
Holyoke	L. Wfld Rd & Homestead Ave	Whiting Farms Rd to Upland Rd	Project Completed
Longmeadow	Route 5	Forest Glen Rd to Williams St	Further Action Req.
Ludlow/Spfld	Route 21	East St to North Branch Parkway	TIP Project
Northampton	Damon Road	Industrial Drive to King St	TIP Project
Northampton	Route 10	Old South St to main St	Under Study
Northampton	Route 9	Market St to Prospect St	Further Action Req.
Springfield	Magazine St & Armory St	Worthington St to Armory St/I-91	Further Action Req.
Springfield	Main St & Locust St	Fremont St to Belmont Ave	Further Action Req.
Springfield	Route 20A (Page Blvd)	East St to Oakdale St	Under Study
Springfield	Route 20	Rte 20 plainfield St/Avacado St	Further Action Req.
Springfield	Sumner Ave	Forest Park Ave to White St	Further Action Req.
W. Springfield	Route 5	Ashley Ave to Morgan Rd	Under Study
W. Springfield	Route 20	Kings Highway to the Rte 5 Rotary	Under Study
Westfield	Mechanic St & Meadow St	Rte 20 to Rte 10/202	Under Study
Westfield	Rte 10/202	Main St to Sunset Dr	TIP Project
Westfield	Washington St & Franklin St	Court St to Elm St	Under Study
Westfield	Route 20	E. Mountain Rd to Westfield Shops	Under Study
Wilbraham	Stony Hill Rd	Springfield St to River Rd	TIP Project

Congestion typically occurs when the demands on a system surpass the actual handling capacity. These types of conditions are prevalent in areas where a number of roadways converge onto a single segment, like major bridge crossings. Limited by lane capacity and expensive to construct, bridges have a tendency to bottleneck traffic with few alternative routes of travel. Congestion reduction is a priority of ISTEA. Feasible alternatives to congestion relief through increases in roadway capacity without actual lane expansion are strongly encouraged. This approach requires that vehicle users, commuters and travelers alike, change

their travel patterns and opt for more congestion friendly alternatives such as public transportation, ridesharing, bicycling and walking.

Congestion problems are inventoried and analyzed using the Congestion Management System (CMS) and the input of communities. Pioneer Valley traffic congestion is localized but is very problematic in areas like Route 9 in Hadley, Route 10/202 in Westfield, I-91 and Sumner Avenue in Springfield, and Route 66, Route 10 and Main Street in Northampton. The CMS, summarized in Appendix B, prioritizes the deficient corridors and Table 2 outlines some of the current corridors with congestion.

3. Preservation

Routine maintenance activities have not kept pace with the deterioration of our transportation investments. Public dollars must be directed at the preservation of the existing infrastructure now more than ever. Priority for maintaining the existing system requires a more efficient use of capacity, enhanced safety and travel conditions, and efficient use of limited funds.

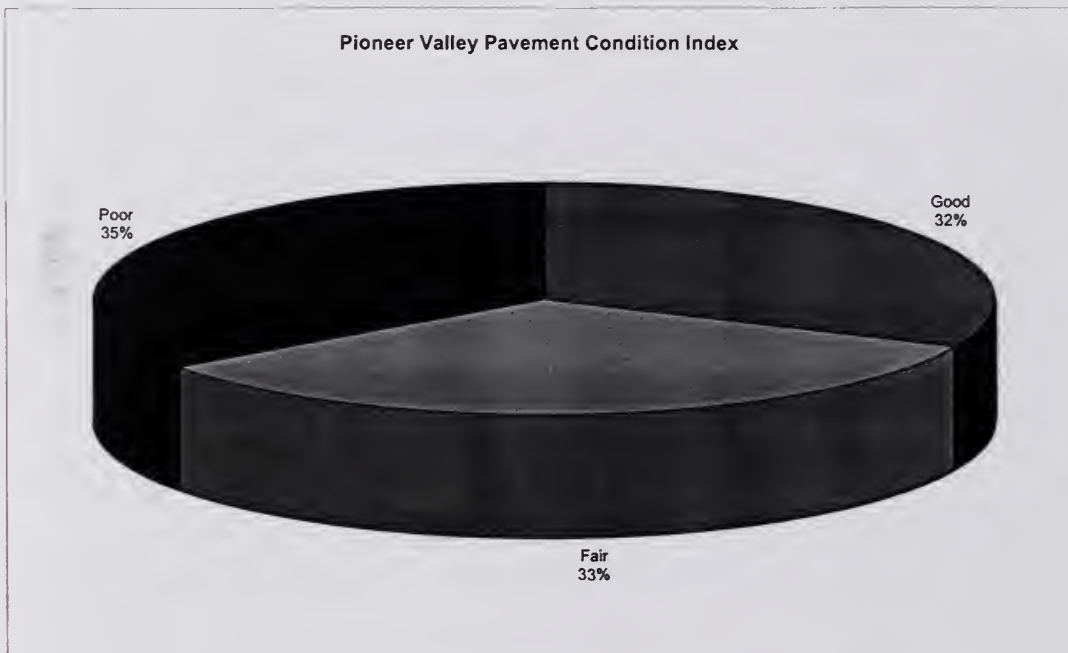


Figure 5
pavement management system
findings - current condition (1996)

Figure 5 shows the percentages of surveyed federal aid roadways in the Pioneer Valley for each condition category. Roads in "Poor" condition have a pavement condition index (PCI) of below 65. Roads with a PCI of 65 to 85 and 86 to 100 fall into the "Fair" and "Good" categories respectively. Best management practices suggest that roadways be refurbished before they reach poor condition because it is the most cost effective way to maintain pavement. It requires far more money to stabilize the overall condition of a road network, when even a small portion of the road reaches a condition of major investment (reconstruction or rehabilitation) than to attend to preventive and routine maintenance. Priorities arising out of the pavement management system target roads in poor condition for obvious reasons, but it also recommends significant outlays for roads in the fair category. The usable lifespan of a roadway is maximized if refurbishment occurs at this stage of deterioration.

4. Vehicle Emissions

The Clean Air Act Amendments (CAAA) of 1990 require that all areas that fail to meet the National Ambient Air Quality Standards (NAAQS) for Ozone develop a plan that will reduce overall emissions levels. Dependency on automobiles in the region has hit an all-time high. Nearly 80% of all work trips and a greater percentage of other trips are now performed with automobiles. Urban sprawl, low gas prices, and the increase in "two worker households" are three of the main reasons for this trend. It will be critical for air quality and the overall health of the residents of the region, to use both direct and indirect methods to reduce the dependency on automobiles. It has become necessary to emphasize planning better developments, increased use of alternative modes of transportation and increased education on the drawbacks of driving if we are going to be successful in reducing emissions.

5. Access

The key to being economically successful is establishing and/or maintaining adequate access to the natural, economic, social, historic, and cultural resources of the Pioneer Valley. As the location of the crossroads of Interstates I-90 and I-91 within the Valley's boundaries makes inter-regional and interstate travel very accessible. Likewise, the region's proximity to Bradley International Airport, Northeast Corridor Amtrak service, the network of arterial and rural roads, transit systems and bicycle and pedestrian ways ensure physical access to educational institutions, military installations, unique regional historic and cultural resources, beautiful recreational areas and business and retail centers throughout the region.

Providing adequate physical access to the region's resources does not, however, necessarily guarantee that they will be recognized and/or used to their full potential by the residents of, or visitors to, the region. Informational access is also important in moving people throughout the region and assisting them in accessing the resources available in the Pioneer Valley. Chambers of Commerce, tourist information organizations and brochures all enhance access to Pioneer Valley sites and activities.

B. TRANSIT AND PASSENGER TRANSPORTATION

1. Maintaining and Increasing Ridership on Fixed Route Service

After showing modest declines in ridership from 1985 to 1990, the public transit system in the Pioneer Valley has rebounded with ridership improvements over the past few years. This trend must continue to maintain the viability of transit as an alternative to the automobile. The PVRTA has updated its system on a phased basis by concentrating on initiatives that reduce travel time for its patrons. Reducing waits for transfers, improving headways (decreasing the time between buses on a specific route), and re-routing to better serve major trips generators have been priorities. To compete successfully with automobile transportation, it is necessary to sustain these efforts.

2. The Decrease of Operating Subsidies

Currently, operating funds for the PVRTA come from six sources: 5% from the FTA, 48% from the Commonwealth, 27% from the farebox, 19% from their member communities, and less than a percent each from earned interest and advertising. Nearly all of these sources of revenue are shrinking or have been capped and it is becoming increasingly difficult to expand transit. In areas like the Pioneer Valley, transit is deemed more of a public service for the transportation disadvantaged than an actual commute option. A greater commitment must be made to transit as a commute option, if our goals of fewer vehicle miles, lower emissions, and improved environmental quality of our transportation system are to be achieved.

3. Accessibility

The Americans with Disabilities Act of 1990 (ADA) was enacted on July 26, 1990 and it provides a comprehensive framework and approach for ending discrimination against disabled individuals. As of July 1995, PVTa entered full compliance with the ADA law meaning that they have adhered to all accessibility regulations required of them.

During the development of the RTP, a substantial number of comments received raised the issue of accessibility for the elderly and disabled residents of the Pioneer Valley, especially the elderly. To be eligible for ADA paratransit service, one must submit an application and documentation from a physician of some sort of disability - mental or physical, permanent or temporary. Age, however, is not one of the criteria for establishing a disability under ADA eligibility requirements. Therefore, many elderly persons are unable to access paratransit systems because they are ineligible under ADA. The PVTa, the largest paratransit provider in the region, makes every effort to accommodate non-ADA eligible seniors, but capacity is severely limited because PVTa, by law, must first use its fleet of vehicles to satisfy the transportation needs of its ADA eligible users. The overriding problem in this issue is the sheer expense of providing "door to door" paratransit service. The average paratransit trip (per unit) can cost between \$4.50 and \$15.00 depending on trip distance. That is two to ten times more expensive than providing these trips on the fixed route transit system. Efforts to accommodate more elderly must continue through more efficient use of the current or an expanded paratransit fleet, subsidization of other local providers, and greater use and coordination of the fixed route transit system.

4. Intermodal Coordination

The Springfield Bus Terminal is currently the only true passenger intermodal center in the Pioneer Valley. Connections between intercity carriers, such as Peter Pan Bus Lines, and the PVTa can be completed between 6 AM and 10 PM at the facility. Amtrak is accessed on Lyman Street which is several blocks away from the terminal and is therefore, not convenient for bus passengers to transfer to and from train service. Peter Pan does offer hourly service to Bradley Airport.

Union Station in Springfield has enough space to house an intermodal terminal served by Amtrak, Peter Pan and other intercity bus carriers, PVTa, taxi and jitney services, bicycle and pedestrian, and automobile modes. A potential long range project that will rehabilitate Union Station is included in the next section. Another intermodal center to be located at UMass-Amherst has also been discussed but has not yet reached preliminary planning stages.

5. Intercity Bus Services

Intercity bus service to and from the Pioneer Valley is quite extensive. Companies like Peter Pan, Bonanza, Greyhound and Vermont Transit, provide bus services to cities throughout New England and beyond. Peter Pan, for example, offers hourly service between the Pioneer Valley and Boston every day. As congestion increases and poses more of a problem for intercity travelers, it is in the best interest of the region to promote these services as a viable alternative to the automobile.

6. Passenger Rail

In recent years, Amtrak has experienced several reductions in federal assistance resulting in multiple service cuts. The Montrealer, once the primary north/southbound trains serving the Pioneer Valley, has been reduced to one trip per day and terminates in Vermont (now called the Vermonter). The LakeShore Limited, service between Chicago and Boston, is no longer routed through Springfield, and is actually diverted to New York City from Albany and then is routed to Boston. As a result, train service to the Pioneer Valley has been reduced

to one round trip to Boston and five trains to and from New Haven. None of the trains are convenient for commuters to jobs outside the region and are basically limited to long distance travelers. As traffic congestion on I-90 to Boston and I-91 to Hartford increases, it will become necessary to explore the use of commuter rail as an alternative mode. Diesel multiple units (DMU)-propelled single train cars, could potentially offer cost effective commuter service. As ridership increases, DMUs can be linked together to easily increase capacity.

Another issue, other than funding, faces Amtrak. Aside from the Northeast Corridor (tracks between Washington, DC and Boston), most of the track used by Amtrak is owned and maintained by private freight train companies. A significant portion of private track is not maintained well enough for Amtrak to operate at the speed necessary to keep passenger travel times short enough to provide a viable alternative to other modes. Class I tracks, which allow a maximum speed of ten miles per hour, are often adequate for freight companies, especially short lines. Ridership suffers since Amtrak must detour around tracks of this rating. Providing incentives to these freight companies must be considered so that passenger rail can operate more efficiently.

Federal funding has recently been used to study the prospects of high speed rail (HSR) in the Northeast Corridor. Springfield is considered part of the Northeast Corridor because of its proximity to I-91 and I-90 and to the two inland rail routes between New York and Boston. Aside from the coastal route through New Haven and Providence, trains between New York City and Boston also use an inland alignment through Hartford and Springfield, or an even further inland route that serves Albany and Springfield. One possible application of HSR, would be between Albany and Boston. HSR could offer transportation services between the Pioneer Valley and Boston with travel time as short as forty-five minutes and play an instrumental role in mitigating traffic on the turnpike.

7. Air Passenger Service

Passenger air service for the Pioneer Valley is primarily accessed at Bradley International Airport in Windsor Locks, Connecticut. It is located about twenty miles south of the Springfield Central Business District. Logan International Airport, in Boston, is also used by Pioneer Valley residents to a lesser extent. Several ground transportation providers such as Valley Transporter and Peter Pan, offer shuttle and/or bus service to the airport. Many have raised the issue, though, that access to the airport and the many adjacent major employers has been problematic. In cooperation with the Hartford region, a study will be conducted in the next few years, that will examine the issue of access to Bradley and its surrounding area from Massachusetts for both automobiles and public transportation.

C. TRANSPORTATION GOODS

1. Trucking

Maintaining the efficient movement of goods is critical to economic stability and trucking plays a major role. Several issues, however, surface when addressing truck transportation as a vital piece of the future regional infrastructure. A delicate balance must be maintained between economic vitality through the movement of goods, free enterprise, damage to the highway infrastructure, governmental regulation and truck safety.

The legal size and length of trucks, or more precisely the amount of allowable cargo space is central to the aforementioned issues. Larger trucks offer more cost effective movement of goods simply because they are able to haul more at one time. In contrast, smaller trucks are easier on pavement and bridges, and tend to be operated more safely.

An area which also merits further study is the consideration of signed truck routes (advisory and/or regulatory) in some areas. These routes should be set up to minimize the impacts of trucks on residential neighborhoods and on roads not equipped to handle them, thus addressing the rapid deterioration of roadways and safety. At the same time, however, the truck routes must allow access to commercial and industrial areas and not require extensive detours which would be time-consuming or costly to the trucking industry.

2. Railroads

Increasing the importance of rail and its role in goods transportation is a top priority in the region. The efficiency of rail for long hauls, and the economic benefits of having rail facilities in the region are strong reasons to emphasize rail. Two intermodal rail facilities currently operate in the Pioneer Valley: the Springfield Rail Yard in West Springfield and the Mass Central Rail Ramp and Intermodal Terminal in Palmer. Both are privately owned and operated so direct public involvement in the improvement of these facilities would prove to be difficult. However, the region has chosen to support these facilities by improving the access to these facilities. All roadways leading to the yards have been added to the National Highway System (NHS), and improvements to these roads are now eligible for federal funding under the NHS.

The Palmer facility also serves as one of only two US Customs facilities in Massachusetts. Containers bound for the Northeastern US from Europe, Canada and Asia pass through the facility, on their way to New York or Montreal or they are transferred to truck to be taken to points in New England. By having this facility in the region, companies are more likely to locate here, and the region benefits from customs fees associated with the trade route between Asia and Europe. One issue of critical importance is the access for truck traffic between the facility and the Massachusetts Turnpike. Currently, trucks traveling between the turnpike and the Palmer rail yard must pass through the center of Palmer and the intersection US 20 and State Route 32. The route is very indirect and does experience moderate congestion at peak periods. This is an area in which the public sector can both help improve the efficiency of the system and should examine it in the near future.

3. Air Freight Access

Both Barnes Airport in Westfield and Westover Air Reserve Base and Airport have been included in the Intermodal Management System. The roadways accessing these facilities have been added to the National Highway System, making them eligible for federal funding. Efforts are underway to expand freight operations at both airports. Their access roads will be monitored closely and improved accordingly.

D. NON-MOTORIZED TRANSPORTATION

Bicycling and pedestrian needs in the region are assessed in the Pioneer Valley Bicycle and Pedestrian Plan. The Plan includes information and recommendations on incorporating bicycle and pedestrian features into road reconstruction projects, using zoning and development tools to help create environments that support bicycling and walking, increasing bicycle and pedestrian safety, and promoting bicycling and pedestrian activities as alternative transportation choices.

The main purpose of the plan is to guide development in the Pioneer Valley region in ways that encourage and facilitate bicycling and walking as transportation options. Community interest in the Pioneer Valley Region has strongly supported the creation of off-road, multi-use trails. Over half of the region's 43 municipalities are currently planning trail projects. Applications to the Transportation Enhancements program of the federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) overwhelmingly favor trail development rather

than on-road projects. Off-road facilities play a major role in the Enhancement Plan because they are a method of preserving transportation right-of-ways. However, the cornerstone of any system aiming to foster walking and cycling as transportation choices are road and street-based projects such as bike lanes, bike routes, and sidewalks. Road and street-based projects:

- allow for easy access into residential neighborhoods and central business districts;
- are suitable for making short, local trips;
- are less costly to design and construct than multi-use trails, and;
- can be incorporated into road resurfacing and reconstruction projects for further cost savings.

Trail projects are seen by the riding public as a separate and distinct system from the existing transportation network and, therefore, are more popular than road and street facilities. Road and street facilities are seen as unsafe to novice cyclists because of the close proximity to traffic. The plan recommends to improve the suitability of roadways for bicyclists, in addition to expanding the off-road network. By improving the safety on-road facilities, both on-road and off-road facilities can be viewed as a system and more of a viable commute alternative to driving.

E. LAND USE AND DEVELOPMENT

Land use planning is one of a variety of Transportation Control Measures (TCMs) recognized by the 1990 Clean Air Act Amendments as being appropriate for inclusion in the State Implementation Plan (SIP) required of states with areas that do not meet federal air quality standards. Since the Pioneer Valley fails to meet the standards for ozone, land use measures are a point of emphasis for the region. The relevance of land use regulations to the region's transportation-related air problems are demonstrated by the following trends.

Pioneer Valley development during the 1980s and 1990s has been marked by continued low-density sprawl. This occurred most strongly in the residential sector, where rural towns experienced growth rates of up to 90 percent. At the same time, population for the region as a whole was essentially stable, increasing just 3.6 percent. The contrast indicates a dramatic migration of residents from the region's urban core to its outlying ex-urban communities.

The emerging picture is a region of bedroom communities and employment centers, with commuting routes becoming longer. There was a 37 percent increase between 1980 and 1990 in workers traveling to communities other than the region's five major cities. In addition, the 1990 US Census shows that over 60% of the region's commuters live in a community other than the one in which they work.

Increased sprawl is an issue because it increases dependence on the private automobile for accomplishing routine activities such as working and shopping. In the decade between 1980 and 1990, vehicle miles traveled (VMT) in the Pioneer Valley region increased 27%, from 7.4 million to 9.4 million. Other impacts of sprawl on auto use in the region include:

- The number of cars registered per person increased 35.3% region-wide between 1980 and 1990.
- The move to rural areas is for most people a move further away from work. In Belchertown, for example, a 90% increase in new housing permits was accompanied by a 110% increase in work trips to Springfield, over 45 minutes away. Region-wide, the highest numbers of new building permits are occurring in the outlying areas and fewer in the urban core.
- Between 1980 and 1990, carpooling declined from 19% to 11% of all work trips. There was a corresponding increase, from 67% to 77%, in the proportion of work trips made by single occupancy vehicles.

- Automobiles are a significant source of pollutants regulated by the federal government under the Clean Air Act. Much of the vehicular use in the region is a result of land use and development patterns where the only mode of transportation that has convenient access is the automobile. For example, in suburban development set apart from other land uses, the residents must use a vehicle for all daily activities.
- The pollutants from automobiles put Pioneer Valley residents at increased risk of developing chronic respiratory system damage. Poor air quality diminishes quality of life and results in a negative impact on the economy.

F. ENVIRONMENTAL ISSUES

1. Air Quality

The entire State of Massachusetts is classified as a serious non-attainment area for ozone. Another major air pollutant of concern is carbon monoxide (CO), and the City of Springfield is the only CO non-attainment area in the Pioneer Valley, although it is not designated. These non-attainment classifications, therefore, require Massachusetts to conduct transportation planning activities that are sensitive to air quality levels and toward the reduction of vehicle emissions.

ISTEA requires that at least all transportation projects built with federal funds, such as those administered by the Federal Transit Administration (FTA), or with approvals from the Federal Highway Administration (FHWA), must come from a transportation plan and program that conforms with the CAAA of 1990 and the State Implementation Plan.

The pollutants, Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOX), react together in conjunction with warm temperatures, humidity, windspeed and sunlight to produce ozone (O_3). In Massachusetts excessive O_3 levels have occurred in the summer months, thereby, requiring emission inventories for these compounds in tons per summer day (TPSD). Similarly, excessive CO emissions have occurred in the winter at various locations during the months November through March, requiring an emission inventory for CO in tons per winter day (TPWD). These emissions are at their highest during the winter due to vehicle cold starts. During a cold start the engine temperature affects its combustion efficiency. Incomplete combustion of fuel causes compounds such as CO to be emitted into the air.

VOC emissions originate from various sources such as fuel combustion processes, on and off-road mobile sources, biogenic sources and various solvent processes. CO and nitrogen dioxide (NO_2) emissions, key components of NOx, originate from fuel combustion by on and off-road mobile sources as well as stationary sources. Emissions such as VOC are transferable depending on weather conditions and geography of the land. In Western Massachusetts, emissions generated in areas to the south, and east such as New York City and New Jersey, are transmitted via prevailing winds. This type of emissions displacement can intensify adverse conditions within a region of relatively low emission levels. Similarly, areas to the north of Massachusetts experience the displacement of emissions generated in the Commonwealth.

2. Water Quality

Water quality and land use are closely related. Human activities related to the development and use of land can pollute water supplies through the intentional or accidental release, or discharge of potential pollutants. Pollutants can run-off the surface of the land and enter surface water supplies, lakes, streams, ponds, and rivers. Pollutants can also leach into the ground and contaminate ground water supplies. Transportation related land uses such as airports, highways, rail yards, and truck terminals take up a large portion of the region and have a significant impact on water quality.

Non-Point Source Pollution

Motor vehicles are the most widespread and difficult to manage non-point sources of pollution. The emissions from the internal combustion engine, at first absorbed into the atmosphere, fall back onto land and water surfaces. Fluids, used to lubricate and cool moving parts, leak out during the lifetime of a vehicle and are deposited on land surfaces. Other vehicle components such as brakes and tires wear away through friction, scattering hydrocarbon and metal elements across our region's highways and parking lots. Gasoline and service stations for these vehicles potentially become sources of greater pollution when fluids are accumulated in greater quantities and spills occur. Commercial establishments that rely on heavy automobile access, such as fast food franchises, become "hot spots" of vehicle related pollution. The parking lot, road and highway infrastructure required for automobiles increases the amount of impervious surface in a watershed and contributes to increased stormwater runoff. The associated maintenance practices of salting and sanding parking lots and roads also contributes pollution. All of these vehicle related pollutants deposited on impervious surfaces eventually find their way into our streams, lakes and rivers during rain storms.

Major Roads Cross Water Supply Recharge Areas

Major roads and highways cross much of the Pioneer Valley's public water supply areas, placing them at risk of contamination from the salts, petroleum hydrocarbons, asbestos, solids and metals in highway stormwater runoff. Of the region's 298 public water supply wells, 144 have a highway or interstate passing within their interim wellhead protection areas. Where recreation facilities such as campgrounds, parklands, motels and restaurants are grouped, clusters of public wells appear directly along the highway. Sections of special note include Rt. 20 in Monson and Brimfield, Rt. 19 in Brimfield and Wales, and Rt. 202 in South Hadley and Granby. Several miles of major roadways pass through DEP Approved Zone II areas, including Rt. 10 in Southampton and Westfield, Rt. 202 in Westfield, I-91 in Hatfield, Rt. 9 in Amherst and Belchertown and Rt. 57 in Southwick.

Transportation Support Facilities Can be a Major Source of Pollutants

Transportation facilities, including bus terminals, and government and private fleet service areas, are a potential contributor of non-point source pollution since they are similar to general service gas stations or vehicle repair service shops. In addition to engine and body maintenance, maintenance shops wash and fuel the vehicles on-site. These activities produce solid and liquid wastes, as well as stormwater runoff from paved surfaces. These wastes include: used oils, oil filters, gasoline and diesel fuels, antifreeze, solvents, brake fluid, batteries, sulfuric acid, battery acid sludges, empty contaminated containers and soiled rags. Leaking underground storage tanks can cause groundwater contamination and create a safety hazard. Stormwater can be contaminated by any of these wastes that are not stored properly.

Urban Run-off and Combined Sewer Overflows

Combined sewer overflows (essentially stormwater discharges to bodies of water containing raw sewage from sanitary sewer lines) are a serious problem in the lower Pioneer Valley, preventing the stretch of the Connecticut River south of the Holyoke Dam from reaching fishable/swimmable standards. In 1988, the seven communities of Agawam, Chicopee, Holyoke, Ludlow, South Hadley, Springfield and West Springfield commissioned a CSO study by a consultant. The study identified 134 CSO outflow points and provided recommendations for achieving needed reductions - primarily by separating tributary sewer lines. In addition to local streets, combined sewers also occur beneath sections of several state highways, and I-90. Stormwater runoff from roads, parking lots, and buildings is greater than the capacity of the combined sanitary and stormwater sewer lines. Rather than have the waste water treatment plant overwhelmed and create flooding in basement and streets, combined systems have been designed to discharge this additional volume to the river.

Where separation of storm and sanitary sewers has occurred, direct discharges of stormwater still cause problems. Run-off, once thought to be clean, in fact contains a number of pollutants. Runoff from urban areas has been shown to contain many different types of pollutants, depending on the nature of the activities in those areas. The runoff from roads and highways is contaminated with oil and grease, lead, cadmium, and other pollutants. Uncontrolled runoff from industrial sites can contain PCBs, heavy metals, high pH concrete dust, and many other toxic chemicals. Residential areas contribute herbicides, pesticides, fertilizers and animal waste to runoff. All of these contaminants can seriously impair beneficial uses of receiving waters. The Massachusetts Department of Environmental Protection recently developed and released a Stormwater Management Policy. The policy provides standards and guidelines for controlling run-off and should be consulted for all stormwater mitigation projects.

These discharges can also contribute to stream erosion and flooding which can greatly affect aquatic life. Habitats are drastically altered when a stream changes its configuration and deposits its sediment load in response to huge stormwater surges. Run-off also tends to cause an increase in water temperature from heated surface runoff and as vegetation which shades the water is removed. This increase in water temperature may cause algal blooms which reduces the amount of dissolved oxygen in the water. The lack of dissolved oxygen can kill fish and other aquatic organisms.

Road Salt and Sanding Practice

Highway maintenance requires numerous operations that can impact water quality. These include: salting and sanding roads, inspecting and maintaining stormwater facilities; and other "housekeeping" practices. Proper maintenance of public and private stormwater facilities (catch basins, detention basins, swales, culverts, outfalls, etc.) is necessary to insure they serve their intended function. Without adequate maintenance, sediment and other debris can quickly clog facilities, making them useless. Rehabilitation of such facilities is expensive, and in the case of infiltration systems may be impossible. Polluted water and sediments removed during the cleaning operation must be properly disposed. Some house-keeping practices that can affect water quality are street sweeping and cleaning out stormwater catch basins.

Gravel Roads Require Proper Design, Maintenance and Repair to Prevent Erosion and Sedimentation

Heavy storms produce rapid water velocities which increase the potential for soil erosion especially on and around gravel roads. Pollutants such as oil and grease can also be washed from gravel roads along with exposed soil, and fine sands and silts. These roads, by nature of their topography and design, can, if not properly managed, contribute heavily to this significant water pollution problem. These sediments and pollutants are then carried away into nearby streams and ponds. Sedimented waters are the major cause of water quality problems in both lakes and streams.

CHAPTER 8

long range strategies and projects

A. HIGHWAY SYSTEM IMPROVEMENT STRATEGIES

The goal of the RTP focuses on the attainment of a safe and dependable transportation system. In a first step to achieve this goal, the system's present and future deficiencies have been identified. The second step is to develop a plan of action to address the deficiencies while adhering to the policies and objectives of the RTP. The third and final step towards the RTP goal is to implement program improvement activities that will enhance the transportation system. This process is continuous and as improvements alleviate deficiencies in the transportation system the goal of the RTP is achieved.

The present and future deficiencies of the Pioneer Valley highway system are identified in previous sections. The plan of action focused at addressing these deficiencies begins with a set of priorities. The priorities are based in part on the issues concerning our existing systems as well as the systems needs. The equally important priorities of improvement activity for the Pioneer Valley Region are presented below in :

- Safety;
- Congestion Relief;
- Preservation;
- Enhanced Mobility; and
- Environmental Improvement.

Improvement proposals should focus on these items as a set of objectives to be achieved over the long range. In achieving these objectives, the first alternative for consideration should be directed toward the improvement of existing facilities rather than construction of new facilities. In either case, a complete analysis of alternatives is necessary prior to recommendation of an improvement action. The resultant action will, therefore, be consistent with the cost effective, environmentally aware, efficient objectives identified in the RTP.

In the absence of analytical support, the proposed plan of action will present a general course in which the above mentioned priorities will be addressed. Communication with local officials will continue to define the alternatives to be analyzed. Regardless, the proposed plan of action will be financially constrained by the estimates of future apportionments in the Pioneer Valley Region through the year 2020, as well as following the guidelines of the RTP's policies.

1. Safety

The highest priority within the Pioneer Valley region related to safety is the rehabilitation of the bridge system. Of the 677 bridge structures within the region, nearly 100 have been rated as structurally deficient. The continuous deterioration of bridge structures without restorative measures presents a serious problem in terms of safety as well as cost effectiveness. The plan of action for the Pioneer Valley Region is to address the deficiencies in a timely manner before conditions deteriorate to unsafe and/or irreparable conditions.

The projected budget for bridge improvements within the Pioneer Valley Region is estimated to be approximately 302 million dollars through the year 2020. The estimated cost for bridge projects measured from past expenditures averages to be \$650,000 for rehabilitation projects and 3 million dollars for replacement projects. Through application of the Bridge Management System identified in the ISTEA proposed rule making, the Commonwealth will admin-

ister these funds to the maximum extent possible in a prioritized and cost effective manner.

Safety also focuses on minimizing the number of high accident locations within the Pioneer Valley Region. Intersections listed on the states top 1,000 list of accident locations will be examined through analysis of the accidents, followed by proposed improvements to eliminate hazardous conditions.

2. Congestion Relief

The ISTEA legislation directly addresses congestion mitigation as a planning activity as well as a funding source. As stated in the legislation, areas of congestion or travel conditions that are no longer acceptable to the public, are to be identified as target areas for improvement. The improvement strategies must first consider maximizing the efficient use of existing facilities prior to the recommendation of expansion. A number of these strategies include actions other than roadway capacity expansion, such as travel demand management, traffic operations improvements, growth management, and alternate modes of travel.

Areas of congestion will be identified through the congestion management system, conduction of regional corridor studies and/or through local input. An established set of performance measures will be evaluated to indicate the level of severity of each area. Routine monitoring of these areas will be conducted to determine if the conditions are "re-occurring" or "intermittent". For those areas that are "re-occurring" they will be designated as a congested area or corridor. Priority attention will be given to the relief of those corridors designated as congested. Under the current TIP project priority process, projects that are designed to alleviate these congested areas receive higher priority than other projects.

Other methods of improvement or trip reduction must be analyzed and considered prior to the expansion of capacity. These activities should also be incorporated, if possible, with any capacity improvement in the congested areas. Regional congestion mitigation actions that improve travel flow efficiency or reduce single-occupant vehicle travel are also eligible for federal funds. These projects include signal coordination implementation, high occupancy vehicle lanes, car and van pool service, alternative mode of travel expansion and intelligent transportation systems. The objective of these activities is to reduce congestion and in turn improve air quality throughout the Region.

Several studies and other projects that target congestion relief are scheduled for the near future in the Pioneer Valley. The PVPC, along with the congestion management system, is conducting a signal coordination study for State Street (Springfield), has begun data collection for a corridor study of US 20 in West Springfield and Westfield, and will be responsible for developing a construction mitigation plan for the expansion projects on route 9 and the Coolidge Bridge in Hadley. The PVTa has implemented new express bus service between Northampton and Amherst as a congestion relief effort on route 9. The BTP&D is currently conducting an ITS early deployment plan.

3. Preservation

As defined by ISTEA, Pavement Management is a systematic process that collects and analyzes pavement information used as input in selecting cost-effective strategies for providing and maintaining pavement. The Pavement Management Systems (PMS) now provides a consistent set of recommended improvement actions based on a series of analysis including investment analyses. This feedback will be used as a prioritization measure in determining the appropriate selection of projects based on need and benefit/costs.

The programming of the region's apportionment of highway funds available for roadway preservation will be directly associated with the region's PMS. All projects to be considered

for federal funding will be required to undergo PMS analysis and will be prioritized based on the PMS findings.

Included in the financial element of this plan is a line item for the maintenance and preservation of the current transportation infrastructure. The funds included in this line item will be used for resurfacing and reconstruction of roadways and rehabilitation of bridges. The following table exhibits the financial need for these efforts which must be aggregated since most projects under this category are not regionally significant.

Table 3
maintenance of the system
annual allocation

Category	Unit Cost	Annual Units	Annual Cost	1998-2020 Cost
Pavement	\$250,000/mile	70 miles/yr.	\$17.5 M	\$402.5M
Bridge	\$1.5 M/bridge	15 bridges/yr.	\$ 22.5 M	\$517.5M
Other	\$4.2 M	\$96.6 M	\$ 44.2 M	\$1,016.6M

Source: PMS, TIP from last five years.

4. Enhanced Mobility

Enhancing mobility, like congestion relief, depends heavily on the reduction of vehicle miles traveled and improved highway operations. The twenty-nine intelligent transportation systems user services will play a vital role in enhancing the mobility of the residents of the Pioneer Valley. An early deployment plan, started in January 1997, will organize and prioritize which ITS applications will be most beneficial to the regional transportation network. ITS can improve the operational efficiency of all modes from centralized traffic signal control and automated vehicle locating systems to commercial vehicle applications and automated traveler information systems. They can increase tourism, encourage economic development and most importantly, mitigate areas of traffic congestion. Future updates to the RTP will include recommended ITS applications arising out of the 1997 ITS Early Deployment Plan for the Pioneer Valley. Maximizing the mobility of travelers is often best accomplished by giving the traveler up to date, easily accessed information. Signage, computerized information, and a spectrum of dissemination methods will be necessary.

B. TRANSIT SERVICE IMPROVEMENT STRATEGIES

The resolution of the transit issues outlined in the previous section are predicated upon maximizing the ridership on the system. Of PVTAs current ridership, 62% of the passengers do not have an automobile and are considered to be captive riders. This percentage of captive riders is among the highest in the US and shows that any increase in ridership on PVTAs will come from the non-captive population. New service priorities must target commuters by offering service between trip generators that is more competitive with automobiles. The current financial situation at PVTAs precludes major expansions of service. It will be necessary for the region to concentrate on minimizing travel times on transit, targeting the major corridors for service expansions, and making better use of park and ride lots for intra-regional travel.

1. Route 9 Corridor

State Route 9 corridor between Amherst and Northampton has experienced severe problems with congestion and there is no guarantee that the proposed short range improvements to Route 9 will completely alleviate long range congestion. The region must take steps to reduce congestion in the Route 9 corridor. The Minuteman Express service currently provided by PVTAs is a step in that direction.

Light commuter rail between Northampton and Amherst has surfaced as a possible long range project. This improvement alternative may require the construction of additional ser-

vice facilities over the Connecticut River. At present, express routes between Northampton and Amherst are possible with limited success since there are no viable alternatives to Rte 9 that allow users to avoid traffic delays on Rte. 9. Adding a direct rail line may provide more consistent express service. Developing a HOV lane for only buses and emergency vehicles is another possible solution. This project would require increasing the Route 9 ROW even further than the current expansion project (TIP 1998).

None of these alternatives are recommended until the current roadway and bridge expansion projects are completed and the corridor can be re-evaluated.

2. Intermodalism

With the advent of ISTEA, regions are faced with new regulations regarding intermodalism. As stated in the goal and objectives of this plan, ISTEA's and the Pioneer Valley's basic aim is to coordinate all modes of transportation into one system, thereby increasing the Region's mobility in an economical fashion. Frequent bus (or train) service to park and ride lots, ridesharing programs through employer cooperation, and intra-city and intercity mode coordination are all ideas addressed in the short range element, but will need further examination in the long range. A high level of intermodalism can reduce the travel time needed to complete trips using public transportation. Enhanced service along with the marketing of the clean air benefits must be emphasized to lure people from single occupant vehicles. The creation of intermodal centers at strategic locations will play a major role in this effort. The renovation of Union Station will be examined as a possible intermodal center for Springfield and the surrounding communities. By serving the facility with PVTa, Peter Pan, other intercity bus carriers, Amtrak, and local taxi services, the connections between these service will be seamless and thus enhance the mobility of the residents in the region. The possibility of establishing an additional intermodal terminal at the University of Massachusetts-Amherst should also be explored.

3. Accessibility

Once the fixed route transit system is fully accessible, a fixed route/paratransit coordination plan will be implemented by PVTa. The purpose of the plan is to encourage paratransit riders to make their trips using the fixed route system. Cost per passenger on the fixed route is significantly less than that on the paratransit. Ridership levels on the paratransit system are reaching capacity while the ridership on the buses has recently declined. Many paratransit riders, for one reason or another, are capable of riding fixed route. In order for the paratransit vehicles to be reserved for those who have greater need for that vital service, several methods of encouraging the elderly and disabled to use the fixed route should be utilized. ADA allows RTA's to charge a fare on paratransit up to twice that of the regular transit. RTA's offer discounts on fixed route fares to those who are eligible to use paratransit. More and more bus stops are equipped with shelters in order to make waiting for the bus more comfortable and safer. Improving access to the transit system should be priority.

A comprehensive operational analysis performed on the PVTa system in 1992 suggested the use of General Public Demand Response (GPDR) transit service in areas where fixed routes are cost prohibitive. GPDR is comprised of offering curb to curb van service to a specific area with no restrictions on eligibility for passengers. It requires a reservation in advance, but GPDR can transport individuals from their residence to their destination or to a point where the fixed route can be accessed.

C. MOVEMENT OF GOODS SYSTEMS IMPROVEMENT STRATEGIES

1. Doublestack Clearance

Lack of adequate clearance along rail lines is a major obstacle to improving the economic efficiency of rail freight systems. Doublestacking rail cars can reduce the length of freight trains minimizing the delay and safety problems at railroad crossings while maintaining or even expanding its load. Many bridges are roadways passing over the tracks: when these bridges are to be reconstructed or repaired, the clearance over the tracks should be increased to accommodate doublestacked trains. Most of the clearances in the Pioneer Valley have already been raised to accommodate rail cars with 17 feet of stacked containers (one 9½ ft. and one 8½ ft.). Clearances must now be able to accommodate trains with two 9½ ft.

2. Improved Access to Intermodal Terminals

As mentioned in the Needs and Issues section, the Intermodal Management System (IMS) has been designed to include access roads to intermodal facilities on the National Highway System. Both rail/truck facilities in the Pioneer Valley currently experience some access problems. As the IMS is developed, strategies to alleviate these access issues should be recommended.

3. Increased Public/Private Cooperation

Since the movement of freight is almost exclusively a privately operated industry, the opportunity exists to improve public/private cooperation. Private transportation providers are entitled to representation on the Joint Transportation Committee, but rarely exercise this option by attending the meetings. Future JTC initiatives should encourage more participation from private providers. Through greater cooperation, transportation improvements will have an increased benefit both in the operation of the transportation system and the economy as a whole.

4. ITS Commercial Vehicle Operation

ITS Commercial Vehicle Operation application may be an area for public investment to maximize the efficiency of the movement of goods. An example would be new weighing technology that will allow enforcement officials to weigh trucks while they are in motion.

D. NON-MOTORIZED TRANSPORTATION STRATEGY

The basic strategy for non-motorized transportation in the Pioneer Valley is to continue to develop a comprehensive system of connections between activity centers that accommodate bicycling and walking, as well as other non-motorized forms of transportation. In addition to multi-use path planning, which has been integrated into the transportation improvement process, the Bicycle and Pedestrian Plan recommends exploring on-road facilities to further complete the network. As the network grows, and convenience of non-motorized transportation modes is enhanced, bicycling and walking will become more viable alternatives.

E. LAND USE AND DEVELOPMENT INITIATIVES

A Regional Policy on improved air quality through land use measures was developed and adopted by the Pioneer Valley Planning Commission. While it specifically addresses the single goal of improving air quality, the recommended measures will contribute to the attainment of a variety of other regional goals as well. These include:

- economic revitalization of villages and urban neighborhoods;
- preservation of prime farmland, open space, and environmentally sensitive areas;
- lower infrastructure costs resulting from new development for local governments, consumers and developers;
- reduced traffic congestion;

- energy savings by buildings and vehicles;
- improved quality of life resulting from less time spent driving, increased public amenities, and more convenient access to stores and services;
- increase in diversity and affordability of housing stock;
- increased mobility for children, elderly and the disabled; and,
- reduced household transportation costs.

The communities of the Pioneer Valley recognize the connection between air quality and land use patterns. As a means to improving air quality, the communities of the Pioneer Valley will implement land use measures and transportation demand management strategies, where practical, as a tool to affect how we travel, and to reduce vehicle trips and vehicle miles traveled.

1. Develop Transit Friendly Land Uses

Depending on the character, availability of transit service, and other features within each area, communities in the Pioneer Valley can adopt measures to promote development patterns and other land use characteristics that reduce vehicle use. The following objectives can guide communities in the Pioneer Valley as they seek to improve the region's air quality through improved land use patterns.

Developments that are designed for automobile circulation generally exclude buses and other modes of travel from easy and efficient access. Sprawling development patterns generally do not have the densities to support transit service. Areas that do have transit service make transit use less attractive by neglecting bus stops and other necessary amenities. Developments that take transit operation and use into account during design and implementation generally encourage more transit use and make transit operation more efficient. Strategies for developing areas that encourage transit are:

- Encouraging highest land use densities within walking distance (generally 1/4 mile) of transit stops;
- Encouraging new developments served by transit to provide safe and lighted bus shelters, bus pullouts, and benches;
- Creating mixed use areas near transit lines;
- Improving existing transit stops by adding such amenities as shelters, benches and lighting; and also maintaining the stops (e.g. snow and trash removal);
- Making developments more accessible for buses by siting bus stops closer to the front of a site, and by adding bus pull outs;
- Limiting high-density residential, commercial and office development in areas not served by transit;
- Encouraging development proponents to work with transit authorities when planning new high density developments; and,
- Providing adequate automobile and bicycle parking at transit stops, where appropriate.

2. Improve Development Standards to Include Pedestrians and Bicycles

Developments that are designed primarily for vehicles are often unsafe and unattractive for pedestrians and bicyclists. If people do not feel comfortable on foot or on bicycle, they will rely on vehicles for mobility. Some of the strategies include:

- Encouraging a pedestrian circulation plan in all site designs that includes safe, convenient and direct pedestrian pathways within the project, and between the project and nearby land uses, such as residences, stores, work sites, schools, open spaces and/or recreational facilities;

- Adopting design guidelines that promote an attractive pedestrian environment, including features such as sidewalks, lighting, street trees and landscaping, benches, and narrower street widths, as well as promoting safe bicycle use;
- Encouraging pedestrian amenities such as small parks, sidewalks, shelters, benches, and lighting near transit lines;
- Working with state and regional agencies to include pedestrian crossings and bicycle ways along existing roads, and in new road plans, and road reconstruction, where appropriate; and
- Enforcing the state pedestrian crossing law which requires motorists to stop for pedestrians in crosswalks.

3. Promote Reduced Vehicle Use Through Compact Development and Mixing Compatible Uses

Sprawling development patterns require the use of a vehicle to do all of the daily activities that most people have to do. Combining compatible land uses in areas within walking distance of each other requires fewer vehicle trips and vehicle miles traveled. Areas that develop without providing connections to adjacent developments or neighborhoods create the need for increased vehicle use. Developments which integrate opportunities for other modes of travel decrease peoples' reliance on vehicles to take care of their daily needs. Commercial activities such as banks, grocery stores, dry cleaners, and day care centers, which support people's daily needs, should be sited within walking distance of work sites, homes, and each other. Village centers, growth centers and other compact development patterns should be designed to include multiple compatible uses and future infrastructure extensions and limits should be established to prevent sprawling development patterns.

4. Promote Improved Quality of Life in Urban Centers

Urban centers can be examples of pedestrian-friendly, transit-oriented areas with mixed use developments and open spaces connecting to residential, civic and employment areas. Areas like this attract people to live and work within them and thereby reduce overall vehicle use. It is an objective of the communities of the Pioneer Valley to reduce vehicle use by promoting comprehensive planning that improves quality of life, including the economic climate, within urban centers so that more people will be attracted to live, work and conduct business within them. Communities can promote this objective by taking actions such as:

- Working with land owners and developers to use open space for parks or community gardens;
- Providing incentives such as density bonuses or tax credits to property owners who use and improve existing building stock;
- Encouraging property owners or developers to enhance the design of storefronts and areas adjacent to bus stops so that they are more conducive to pedestrian and transit use.
- Encouraging business owners to create additional attractions for people in the urban center by enacting such policies as evening business hours and after-work activities;
- Through zoning and administration, encouraging a range and mix of uses within the urban center that foster vitality;
- Ensuring a range of housing opportunities with varying price ranges within the urban core through zoning and subdivision regulations;
- Promoting other quality of life amenities such as landscaping and aesthetic improvements; and,
- Seeking to improve public facilities including public schools.

F. ENVIRONMENTAL IMPROVEMENT STRATEGIES

The Pioneer Valley Region must also address the need for environmental improvements associated with existing and proposed transportation systems. Actions targeted at preventing or mitigating potential negative environmental impacts should accompany the efforts toward improving the transportation system. The ISTEA legislation identifies this concern by providing funding sources such as the STP enhancement set-aside, the Scenic Byways Program and the National Recreational Trails Funding Program.

Examples of environmental improvement projects which may be eligible for federal funding include: mitigation of water pollution due to runoff; landscaping and aesthetic improvements; acquisition of scenic and historic sites along transportation corridors; scenic or historic highway programs; bicycle and pedestrian facilities; archaeological planning and research; preservation of abandoned rail corridors; control and removal of outdoor advertising; historic preservation and rehabilitation of historic transportation facilities. These activities may be eligible exclusively or in conjunction with highway projects.

Several proposed actions are outlined below which address the various areas on environmental concerns.

1. Water Quality Improvements

The Pioneer Valley region should practice employing "Best Management Practices" (BMPs) to prevent and control urban runoff from highways and streets and its impacts to surface and groundwater drinking water supplies, rivers, lakes and streams. BMPs should be used to mitigate impacts of all new transportation projects. Even more important, retrofitting of BMPs, such as construction of artificial wetlands, retention and detention areas is needed to correct existing problem areas where water quality is impacted by highway runoff. For example, a retention basin is being constructed to control highway runoff from Route 202 which is currently causing water quality problems in Pequot Pond in Westfield. A comprehensive inventory of needed urban runoff control projects should be undertaken in order to prioritize projects for future funding.

Combined sewer overflow problems which adversely affect water quality in the Connecticut River is a primary concern to the region. In many older urban areas, such as Springfield, Chicopee, Holyoke, Agawam, West Springfield, Ludlow, and South Hadley, combined sewers need to be replaced with separate sewer systems. Sewer separation is expensive because it usually requires excavating and repaving streets. Consequently, sewer separation should be undertaken whenever roads or streets are undergoing repairs or reconstruction projects.

Reduced roadsalt programs have been successfully implemented on state highways in Goshen, Cummington, Granby, Belchertown and Pelham to mitigate salt contamination of sensitive water supplies. Under reduced roadsalt programs, winter highway salt application rates are decreased by as much as two-thirds, and alternative maintenance practices, such as salt substitutes, pavement additives, increased sanding and plowing and public education are employed. There are many other public and private water supply areas which are crossed by state highways or other major roads, and could benefit from reduced roadsalt policies. A comprehensive program should be undertaken to map the region's reservoirs, watersheds, aquifer recharge areas and public and private wells and to identify where highways and roads intersect with these water resources. Then, sensitive areas where reduced salt programs are needed should be identified and carried out in sensitive areas.

2. Air Quality Improvements

The most successful strategies for reducing emissions are lowering the level of pollution emitted by individual vehicles through improved technology, reducing traffic congestion by improving intersection levels of service; and lowering overall vehicle use through a reduction in vehicle miles traveled (VMT) and the number of trips. Reducing engine emissions is highly dependent on research of reformulated gasolines, improved exhaust filters and scrubbers, increased vehicle inspection regulations and experiments with alternate fuels like compressed natural gas and electric vehicles. Maximizing the efficiency of intersections is strictly a traffic engineering problem and is accomplished through signal coordination and timing. The Clean Air Act and ISTEA, however, promote the use of both "supply-side" and "demand-side" strategies to achieve reductions in vehicle use. The RTP previously addressed supply-side strategies such as travel demand management, traffic control measures and alternate modes. The primary demand-side strategy for reduced emissions is through land use regulations.

Land use regulations such as; mixed-use forms of development and zoning to reduce low density sprawl and promote high-density, provide a balance of both jobs and housing in close proximity. In addition, impact fee ordinances may be necessary to offset the public costs of development, and to provide transit, pedestrian and bicycle facilities. Trip reduction zoning will be needed to ensure that each new development project considers and includes alternatives to single occupancy vehicle access.

There is a great need and equally great opportunities for providing increased bicycle and pedestrian facilities in the Pioneer Valley region. Walking and biking trails are important not only as an alternative transportation option to increase mobility, but they can also help to improve air quality and are an environmental enhancement which improves regional quality of life. As was discussed previously, a complete inventory of existing trails and paths, and potential trail right-of-ways is needed, in order to identify priority bicycle and pedestrian trail projects. Abandoned rail corridors should be evaluated for potential rail-to-trail conversion projects. Short-term trail projects which are already well advanced in the planning stages should be implemented using ISTEA enhancement funds. Examples of such projects include extensions to the new Norwottuck Rail trail in Amherst and Northampton and development of the Connecticut Riverwalk in Springfield, West Springfield, Agawam and Chicopee.

3. Scenic Highways, Billboard Removal and Landscaping Improvements

There are many important needs for control along commercial highway corridors and for protection of scenic highway corridors in the Pioneer Valley region. One of the regions greatest assets is its scenic beauty. Uncontrolled development, however, has adversely impacted many of these sensitive and vulnerable areas. A set of strategies aimed at minimizing these kinds of impacts will be conducted in concert with the Pioneer Valley Land Use Plan development. These will include the following:

- Land use and zoning strategies to control commercial strip development and blight along major transportation corridors, which afflicts many communities in the region;
- Protection strategies for scenic highway corridors, such as the Route 20-Jacob's Ladder Trail corridor from Huntington to Becket, and the Route 47-scenic farm highway from Hadley to Sunderland;
- Land acquisition strategies to protect scenic areas along highway corridors;
- Historic preservation strategies for important transportation-related structures and historic site along highway corridors; and

- Landscaping, billboard removal, and aesthetic improvements to commercial highway corridors, which may be eligible for enhancement funds.

G. REGIONALLY SIGNIFICANT SHORT RANGE PROJECTS INCLUDED IN THE MODEL NETWORKS

1. Relocation of Route 57 in Agawam and Southwick

This project has been funded under the 1996 Massachusetts Transportation Bond Bill and entails the bypass of the current Route 57 in Feeding Hills (part of Agawam).

2. Reconstruction of the Route 116 Bridge in Chicopee/Holyoke

Included in the deficient bridge listing in the previous section, the Route 116 bridge spans the Connecticut River between Holyoke and Chicopee. It is scheduled for reconstruction in FY 1998.

3. Widening and Reconstruction of the Great River Bridge in Westfield

Included in the deficient bridge listing in the previous section, the Great River Bridge spans the Westfield River in Westfield. It is scheduled for reconstruction in FY 1998. This project also entails the addition of a sister span and a clearance increase to a Conrail Bridge just north of the river crossing. The roadway is a combination Route US 202/ Rte 10 and serves as the main corridor to the Massachusetts Turnpike and points north of the city. The project is expected to improve traffic flow and enhance the safety of the roadway in terms of easing the burden for trucks to pass through the area.

4. Widening and Reconstruction of Route 9 and the Calvin Coolidge Bridge in Hadley

Included in the deficient bridge listing in the previous section, the Calvin Coolidge Bridge spans the Connecticut River between Hadley and Northampton. It is scheduled for reconstruction in FY 1998 and includes the addition of one lane to the bridge and expansion of the roadway to four lanes from the bridge to West Street in Hadley.



The Calvin Coolidge Bridge **1** is scheduled for expansion and reconstruction in FY 1998.

2. Rte 9 in Hadley **2** is scheduled for widening in FY 1998.

Also shown in this photo is the Narwattuck Rail Trail **3**. Opened in 1994, surveys have shown that 25% of all weekday trips on the trail are commuters to work.

5. Blunt Park Connector, Springfield and Route 66 Connector, Northampton

Both of these projects are included in the future element of the current TIP and involve the construction of new roadways. The Blunt Park Connector connects Roosevelt Avenue and Bay Street in Springfield. The Route 66 project entails the construction of a new road connecting Old South Street and Route 66. It will allow traffic to access Route 66 while bypassing the intersection of Routes 9 and 10, which is the busiest intersection in Downtown Northampton.

6. Corridor Signal Coordination Projects in Holyoke and Springfield

Included in the model network for the RTP were several projects involving the coordination of signals along heavily traveled corridors in Holyoke and Springfield. US 5 signal coordination, which will improve the flow of traffic along the corridor substantially, was originally recommended as a part of the Route 5 Corridor Study conducted in 1990 and is now included 2010 action scenario on the model. Four signal coordination projects in Springfield are included in this update to the RTP. Parker Street and Boston Road are primary roadways in the eastern part of Springfield. Both projects include widening and have been advertised but to date, have yet to be implemented. Berkshire Avenue is currently on the TIP and State Street is presently under study.

7. I-91 Exit 13B Redesign and Realignment in West Springfield

Exit 13B provides access to US 5 and the Riverdale Shops in West Springfield for southbound motorists on I-91. The exit ramp experiences excessive delay during non-peak hours that coincide with the opening of the retail center at Riverdale. The primary cause of this delay is the travel pattern for those entering US 5 from the ramp and desiring to turn left into the Riverdale Shops onto Daggett Drive. The project entails the creation of T-intersection at the bottom of the ramp and the implementation of a traffic signal to control the flow of traffic on the ramp and on US 5 southbound. The project is included in the current TIP.

8. Holyoke Mall Expansion Traffic Mitigation

Included in the model's 1999 baseline network is the signal coordination and widening efforts on Whiting Farms Road and Lower Westfield Road that were completed as a part of the expansion at Holyoke Mall in 1995.

H. LONG RANGE PROJECTS


1. Bypass to Rte. 57 West from Julia B. Buxton (South End) Bridge in Agawam

Currently traffic on the Buxton Bridge destined for Route 57 westbound must use the rotary connecting Rte. 57, US 5 and Meadow Street. This results in severe congestion (particularly during the evening peak hours) especially on the off ramp from the bridge and the area has been cited by the regional CMS. The construction of a bypass connecting the bridge directly to Route 57 by means of a one lane westbound ramp bypassing the rotary could eliminate the existing congestion in this area. It would involve the construction of a ramp over US 5 southbound.

This alternative was modeled in the year 2020 action scenario and the results were analyzed. Construction of this bypass is projected to attract 24,000 vehicles per day. Volumes on both northbound and southbound Route 5 north of the rotary, the Memorial Bridge and the North End bridge decrease between 7 and 20 per cent. Traffic on Route 57 westbound, Route 5 southbound to the South End Bridge, and River Road increase between 10 and 20 percent because of the increased capacity available at the rotary due to the new bypass.

This new bypass is considered as the preferred alternative to relieve congestion on the South End bridge, the rotary and Route 57. A feasibility study of this proposal or of other alternatives to reduce congestion at this rotary is recommended.



Westbound travelers on the Buxton Bridge experience significant delays at the rotary, a bypass from the bridge to westbound Rte 57  will improve the level of service of the corridor substantially.

2. Construction of a Slip Ramp for Interstate 291 and ramp reversals on Interstate 91 in Downtown Springfield

In order to access the Memorial Bridge from Interstate 291 westbound vehicles must perform a weave across three lanes of traffic on Interstate 91 southbound in a span of a few hundred feet. This is a dangerous movement and causes a safety hazard at this location. In order to improve the access to the Memorial Bridge on Interstate 291, an alternative is to extend the Exit 7 ramp so that it connects to Interstate 91 southbound just north of its intersection with Interstate 291.

Several major changes to Interstate 91 are also proposed as part of the expansion to the Basketball Hall of Fame, construction of a new tourist information center and a retail pedestrian mall in downtown Springfield. These include construction of a new slip ramp from Interstate 291 westbound to East Columbus Avenue and establishing East Columbus Avenue (currently one way northbound) as a two way street between Interstate 291 and Boland Avenue. In addition, the reversal of many existing Interstate 91 on and off ramps could be modified as shown in Table 4.

The impact of the improvements and traffic circulation changes were modeled for the year 2020 using the QRS Travel Demand Forecasting software and the results were analyzed. The extended Exit 7 is forecasted to reduce traffic on the off ramp from 13,700 vehicles to 8,900 vehicles. The new slip ramp from Interstate 291 is predicted to carry a traffic volume of 2,300 vehicles. In addition, the model showed a decrease in traffic volumes on many of the

roads in the downtown area in the vicinity of Interstate 91. The total change in traffic volume for all the ramps was a reduction of 13,000 vehicles per day from 63,500 to 50,500 vehicles per day.

Table 4
I-91 ramp reversals in
Springfield

Existing Ramp	Proposed Replacement Ramp
1. Northbound off ramp to East Columbus Avenue between State Street and Union Street	Northbound on ramp from East Columbus Avenue between State Street and Union Street
2. Southbound on ramp from West Columbus Avenue between State Street and Union Street	Southbound off ramp to West Columbus Avenue between State Street and Union Street
3. Northbound on ramp from East Columbus Avenue between Broad Street and Union Street	Northbound off ramp to East Columbus Avenue between Broad Street and Union Street
4. Southbound off ramp to West Columbus Avenue between Broad Street and Union Street	Southbound on ramp from West Columbus Avenue between Broad Street and Union Street

Substantial increases in traffic volume were noted on Union Street as traffic was projected to increase from 3,800 vehicles per day without this alternative to 13,800 vehicles per day with this alternative. Similarly, the segments of East and West Columbus Avenue both north and south of Union Street increased from approximately 12,900 to 15,500 vehicles per day. Large increases in traffic were also observed on East Columbus Avenue North of State Street, East Columbus Avenue at the location of the new Interstate 291 slip ramp, the segment of East Columbus Avenue north of Boland Way and on some portions of Interstate 91 in downtown Springfield.

After careful consideration of the available data, it was concluded that the alternatives proposed results in substantial decreases in traffic and greatly improves congestion and air quality in the area. This alternative is currently being studied by a private consultant as part of the Basketball Hall of Fame expansion project. It is recommended that the preferred alternative of this study be advanced and implemented. Based on the available information the alternatives described in detail above are assumed to be the likely preferred alternatives for analytical purposes for this update to the RTP.

3. Construction of a new connection from the end of Interstate 391 to Lower Westfield Road and I-91 in Holyoke (Elmwood Bypass)

Interstate 391 currently ends in the City of Holyoke about half a mile south of the downtown area at High Street and Resnic Boulevard. This results in traffic congestion on many of the local streets as traffic attempts to find the shortest path from the end of I-391 to Route 5 and the Holyoke Mall. The PVPC identified this portion of Holyoke as a congested area in its Route 5 corridor study completed in 1992. The City of Holyoke also requested that this area be included in PVPC's CMS during the public participation process. In order to alleviate traffic congestion in this area, PVPC has modeled an alternative to provide a link between

Interstate 391 and Lower Westfield Road near the Holyoke Mall. Commonly referred to as the Elmwood Bypass, the new road would follow a right of way parallel and to the west of the existing Pioneer Valley Railroad. It would function as an urban minor arterial and would have one travel lane in either direction. The impacts of this alternative on the road network in Holyoke were evaluated for the year 2020.

Traffic volume on the bypass is projected to carry approximately 12,000 vehicles per day. As a result, traffic volumes on Main Street between I-391 and Route 5 and South Street in Holyoke are forecasted to decrease by 13% and 10%, respectively. Traffic volumes are also expected to decrease by up to 7% on Beech Street, Westfield Road and on Interstate 91 in Holyoke. Traffic volumes on Main Street between Interstate 391 and downtown Holyoke were forecasted to increase by 10% as a result of this alternative. The primary reason for these changes is that the bypass will become a very good travel option for residents east of Holyoke to get to the Holyoke Mall. According to PVPC's regional transportation model, the connector showed moderate air quality benefits for the Pioneer Valley.

As mentioned at the public hearing in Holyoke on January 23, 1996, any project of this magnitude will require a Major Investment Study. The bypass is considered the alternative with the most potential to reduce congestion and will be included in the RTP's long range element.




The Elmwood bypass in Holyoke will connect the end of I-391 **1** to I-91 **2**.

4. Non-motorized Transportation Projects

A number of off-road and on-road projects were identified and an implementation schedule has been developed within the Non-motorized Transportation Plan. The short range projects (between 2 to 12 years) that focus on off-road facility improvements include the: Norwottuck Easterly Extension, the Belchertown Rail Trail, the Norwottuck Westerly Extension, the Willamsburg extension of the Northampton Bikeway, Manhan Rail Trail Project in Easthampton, the Chicopee Riverwalk and Bikeway Project and the Southwick Rail Trail. The short range on-road projects include the: UMass to Norwottuck Connector via University Drive, the region-wide improvement of bicycle parking facilities, the State Street/Wilbraham Road bicycle lanes in Springfield, the Route 5 Northampton to Holyoke roadway improvement project, the Holyoke east-west signed bicycle route, and the Westfield Route 10/202 bikeway.

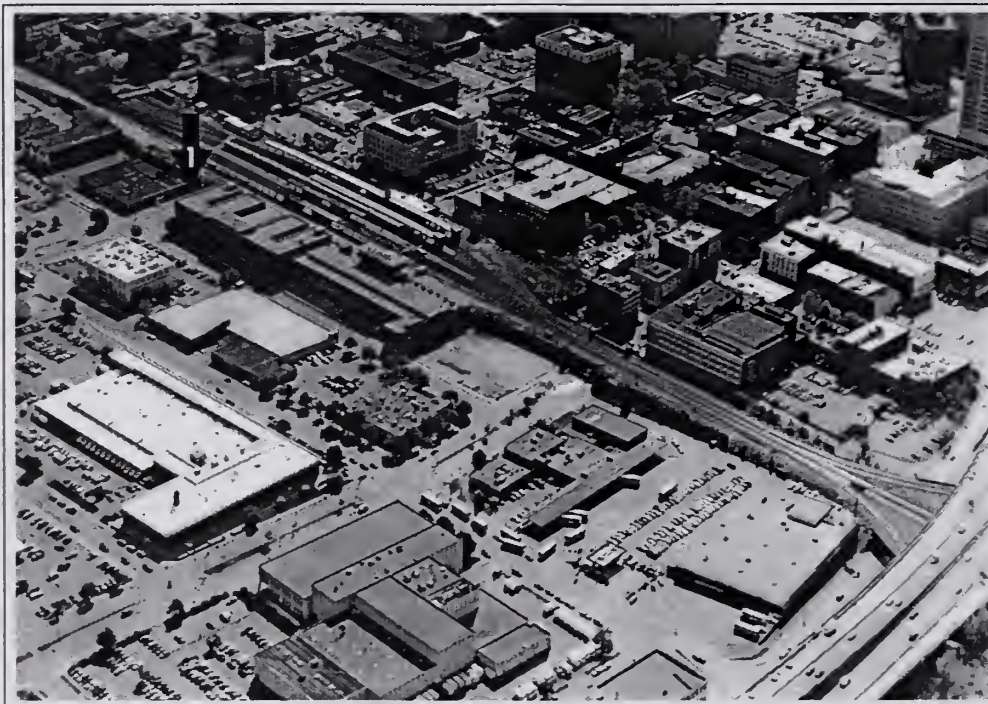
The off-road, long range priorities (to be implemented in the next 8 to 20 years) includes the Ludlow Bikeway project, the Connecticut Riverwalk and Bikeway project as it has been planned to eventually extend the entire length of the river from the Connecticut state line through to the Norwottuck Rail Trail in Hadley and Northampton, and the Hazardville Rail Trail. The long range on-road projects include the Route 116/141 Holyoke-Chicopee bridge improvement, the Route 5 Holyoke to Springfield road improvement, the Route 5/57 Agawam/Springfield bridge improvement and redesign, the Northwest Road in Westfield road improvement project, the Route 9 Belchertown road improvement project, the Route 32 Palmer/Ware roadway improvement project, and the East and Southeast Springfield roadway improvement project.


The Springfield portion of the Connecticut Riverwalk  is scheduled for construction in the next two to three years.



5. Rehabilitation of Union Station for Use as an Intermodal Facility

The City of Springfield recently gained ownership of the vacant Union Station building on Frank B. Murray Street in Springfield. In light of its newly found ownership, the City, in cooperation with the PVTA, has begun efforts to fund a project that would rehabilitate Union Station. The current TIP includes a project, funded under FTA Section 5309, consisting of a full-scale feasibility study of the reuse of Union Station. Preliminary plans for the facility include passenger service to the site from Amtrak, Peter Pan Bus Lines and other intercity bus carriers, PVTA and numerous other local transportation providers. In addition, the facility will house other uses that are undetermined at this point, but could include retail outlets, a transit store, office space, museum, etc.



The rehabilitation of Union Station  in Springfield will provide ample space as an intermodal terminal. It will also provide an opportunity for further economic development in the Pioneer Valley's urban core.

6. Transit Improvement Projects

Farebox Upgrade

An upgrade in farebox technology would have a significant effect on the PVTA. A long range project because of the large investment needed to facilitate the upgrade, technologically advanced fareboxes could play an instrumental role in increasing ridership and automating transit data collection.

New fareboxes will increase ridership by making buses more convenient. Correct change would no longer be necessary for potential riders since new fareboxes are capable of producing change.

The use of smart cards has grown enormously in other industries and could revolutionize boarding procedures. Potential passengers could purchase any number of rides in advance and have it encoded on their card. New fareboxes are capable of reading and deducting the fare from the passenger's card.

Going a step further, a smart card system could automate transit data collection. Urban Mass Transit Act - Section 15 reports would be completed automatically. These reports are mandated by the FTA and must be completed every eighth day by every transit authority nationwide. The data collected, which was surveyed manually in the past, would be highly accurate. Furthermore, the smart card system could be utilized to obtain even more detailed ridership information just by encoding the cards with demographic and socioeconomic information. With the improved information, better routing and operation will result.

Alternate Fuels

A PVTA experiment with Compressed Natural Gas (CNG) vehicles is included in the short range element. In a continuation of that project, it is the goal of the PVTA Administration to expand this experiment to the transit bus fleet. As this technology gains popularity and costs decrease, it is likely that entire fleets across the country will use CNG. PVTA plans to remain on the cutting edge of this technology because the air quality benefits are very significant. It will be necessary, however, to construct a CNG fueling station which would require a significant outlay of funds.

Fleet Improvement Schedule

The average lifespan of a bus is 12-17 years, therefore, every vehicle in the fleet will need replacement at least once before the year 2020. The lifespan of a bus could easily shorten due to increasing regulations on emissions and accessibility, because it may not be feasible to retrofit a bus with satisfactory improvements. ISTEA contains provisions for a management system that allows a transit authority to maintain control over its fleet as well as other transit facilities.

Transit Fleet Parking

The parking facility at PVTA in Springfield will need upgrading by the year 2000. The facility currently houses about 175 buses and 15 vans. Personal parking for employees is extremely limited and any increase in fleet size cannot be accommodated by the facility. Several options will be explored:

- Adding a parking deck to the present facility;
- Moving all paratransit operations to another site; and
- Relocating the entire PVTA operation.

I. LONG RANGE PROJECTS NOT RECOMMENDED FOR ACTIONS

1. Route 9 Bypass (Hadley) and New Bridge over the Connecticut River in Northampton

The Calvin Coolidge Bridge is the only bridge across the Connecticut River in the northern half of the Pioneer Valley region. This bridge along with Route 9 also serves as the main connection between the University of Massachusetts and Interstate 91. Currently, Route 9 experiences severe congestion in the vicinity of the bridge as detailed in a corridor study conducted by the PVPC and the regional CMS.

Increases to the capacity of the Calvin Coolidge Bridge and Route 9 are currently programmed into the 1997-1999 TIP. Based on future transportation forecasts, it is estimated that these improvements will be sufficient to accommodate traffic in this area for at least a decade. The RTP recommends that a Major Investment Study (MIS) be conducted should the regional CMS re-designate this section of Rte. 9 as a congested area. The MIS would identify alterna-

tives for alleviating future traffic congestion including alternate modes of transportation (light rail), traffic reducing land use measures and transportation demand management scenarios (HOV lane). Constructing a new bridge and highway will be cost prohibitive and it is recommended that the region takes every measure possible to maximize the newly expanded route 9 before a new bypass is approved. Funds for a future improvements beyond the current projects are not included in the financial element because it is unclear what the preferred alternative will be at that time.

For the purpose of the RTP, however, a new highway construction alternative was modeled. This involves the construction of a new bridge over the Connecticut River with access to Interstate 91. The construction of a new roadway (Urban Principal Arterial) between Interstate 91 at exit 20 and Route 9 at its intersection with Mill Valley Road was modeled. This new road would intersect Middle Street and includes a new bridge across the Connecticut River. The road and the bridge would have two lanes in either direction and have one on and one off ramp for northbound traffic on Interstate 91 and one on and one off ramp for southbound traffic on Interstate 91. The new bridge is forecasted to attract an additional 24,000 vehicles per day. The traffic volume on the Calvin Coolidge Bridge and Route 9 in the vicinity of the bridge was forecasted by the model to be 47,000 vehicles per day compared to 58,000 vehicles per day without the construction of the bridge. Large decreases in traffic volumes (35 to 50 per cent) were also noted on Damon Road, King Street and Day Avenue in Northampton.

2. Expansion of Rte 21 Bridge over the Chicopee River between Springfield and Ludlow

Cited by the CMS as a congested area, the expansion of the Route 21 Bridge between Springfield and Ludlow was not included in this update because the added capacity actually increased total vehicle miles traveled. This increase was not completely offset by the higher attainable speeds for traffic in the area and therefore was detrimental to air quality conformity of the region.

3. Bypass of Belchertown Center Connecting Intersections of US 202/Rt. 21 & Rt.9/Bay Road.

Cited by the CMS as a congested area, the addition of this bypass also increased total vehicle miles traveled. This increase was not completely offset by the higher attainable speeds for traffic in the area and therefore was detrimental to air quality conformity of the region.

4. New Interchange on I-91 Serving Mt. Tom in Holyoke

This scenario was tested in response to the possibility of new development in the Mt. Tom area, namely a casino. Holyoke has passed referendum on casino gambling but a site has not yet been established. Downtown sites are also being considered. The new interchange attracted substantial volumes of traffic thereby increasing emissions in the area. Recommendation for action is being delayed until a more definitive decision regarding the casino is reached.

5 New Interchange on I-90 Serving Wilbraham

This project consists of the creation of a connector road between the Mass Pike and US 20 with a signal. The model showed that new interchange did not attract enough vehicles to warrant the expense. Air quality improvements were negligible.

J. RTP REGIONALLY SIGNIFICANT PROJECT LISTING

Table 5 outlines all of the regionally significant transportation projects that were analyzed as a part of the development of the 1997 Update to the RTP. Projects, such as bridge reconstruction, are included in the listing but are not considered during air quality analysis because they do not increase capacity. Descriptions of all projects in the table have been included in previous sections. A modified version of Table 5 is included in Section IX - Financial Element to exhibit the estimated costs associated with these projects.

Table 5

Regionally significant projects
analyzed for the RTP

Projects	Recommendation/Status	Model Year	Project Source
Rte 5 Buxton Bridge Reconstruction, Agawam/ Springfield	Recommended for Action Exempt from AQ	N	TIP
Rte 57 Relocation, Agawam to Southwick	In MA Trans. Bond Bill	2010 Build	TIP
I-91 Ramp reversal/ I 291 slip ramp in Springfield	Rec. for Action, requires study	2020 Build	Hall of Fame Study/Spfld
Rte 116 Bridge Reconstruction, Chicopee/ Holyoke	Recommended for Action Exempt from AQ	N	TIP
Rte 10/202 Bridge widening over Westfield River, Westfield	In current TIP	2010 Build	TIP/Westfld
Calvin Coolidge Bridge widening, Hadley/ Northampton	In current TIP	1999 Build	TIP/Rte.9 CS
Rte 9 widen to 4 lanes, Hadley	In current TIP	1999 Build	TIP/Rte.9 CS
Elmwood Bypass Holyoke, Minor arterial connection between I-391 to Lower Westfield Rd.	Rec. for Action, requires study	2020 Build	CMS/Holyoke/ Rte 5 CS
Rte 66 Connector, Northampton	Rec. for Action, requires study	2010 Build	Northampton
Blunt Parkway Connector, Springfield	Rec. for Action	2010 Build	Spfld/TIP
Rte 5 Signal Coordination, Holyoke/W. Springfield	Rec. for Action	2010 Build	Rte. 5 CS
Berkshire Avenue Signal Coordination, Spring- field	Rec. for Action	2010 Build	TIP/Spfld
Intermodal Transportation Center in Springfield at Union Station	Rec. for Action, requires study	2010 Build	PVTA/Spfld
Multi-Modal/Transfer Centers, UMass in Hadley	Rec. for Study	2010 Build	UMass
Parking Expansion at PVTA Facility, Springfield	Exempt	N	PVTA
Smart-card Farebox System Installation	Exempt	N	PVTA/ITS
I-91 Exit 13B-redesign & realignment, W. Springfield	Rec. for Action	1999 Build	TIP
Rte 57 Ramp at South End Bridge/Rotary, Agawam bypasses the rotary for westbound traffic.	Rec. for Action, requires study	2020 Build	CMS
Widening & sig. coord. Boston Rd., Spfld	Former TIP Project	2010 Action	Spfld
Widening & sig. coord. Parker St., Spfld	Former TIP Project	2010 Action	Spfld
Sig. coord. State St., Spfld	Currently Under Study	2010 Action	Spfld
Holyoke Mall Expansion Traffic Mitigation	Completed	1999 Baseline	TIP
Rte. 9 Bypass in Hadley, includes new bridge, interchanges with I-91 Northampton and Rt. 9 at Mill Valley Rd.	Recommend MIS after sched. projects completed	Not included in 2020 build Not included in	Northampton/ Potential CMS Potential CMS/
Light Rail or Bus/HOV Lane on Rte 9, Hadley	Recommend MIS after sched. projects completed	2020 build	Public Part.
New Rte 21 Bridge over Chicopee River, Ludlow/ Springfield	No recommended action	Not included in 2020 build	CMS
Bypass of Belchertown Center connecting intersections of Rt. 202/21 and Rt.9/Bay Rd	No recommended action	Not included in 2020 build	Belchertown/ CMS
New interchange on I-91 at Reservoir Road in Holyoke near Mt. Tom. (potential site for casino)	No recommended action	Not included in 2020 build	Holyoke
New interchange on Mass Pike in Wilbraham, connecting I90 to Rt. 20 by means of connecting road with signal	No recommended action	Not included in 2020 build	Wilbraham

CHAPTER 9

financial element

Title 23 CFR Section 450.324 and 310 CMR 60.03(9) require the RTP to be financially constrained by year. The financial element must demonstrate which projects can be implemented using current revenue sources and which are to be implemented using proposed revenue sources, while the existing transportation system is being adequately operated and maintained. Projects can only be programmed up to the congressionally authorized spending amounts in any individual fiscal year.

A. REVENUE

The overall RTP, and each fiscal year contained herein, is financially constrained to the annual federal apportionment and projections of state resources reasonably expected to be available during the appropriate time-frame. Projections of federal resources are based upon the estimated apportionment of the federal authorizations contained in ISTEA, as allocated to the region by the state or as allocated among the various MPOs according to federal formulae or MPO agreement. Projections of state resources are based upon the allocations contained in the current Transportation Bond Bill, which was adopted in 1996.

Highway side revenue was provided by the BTP&D. Additional funding for highways has been earmarked by the latest Massachusetts Bond Bill for a project on Rt. 57 in Agawam and Southwick. The transit funding sources, including farebox, local, state and federal, were averaged over the last five year period and aggregated through the life of the RTP. The region is also expecting approximately \$30 million in Section 5309 Discretionary funds from a Congressional earmark. These funds will be used for the rehabilitation of Union Station depending on the outcome of current feasibility studies.

B. EXPENDITURES

Regionally Significant Expenditures

Significant Capital Expenditures include projects estimated to equal or exceed \$10,000,000 and any projects, other than maintenance and operating, expected to be funded and are included in the air quality conformity analysis.

The costs of the projects identified reflect generic project cost estimates provided by the Commonwealth and/or the most recent Transportation Improvement Program. Projects analyzed as a part of the development of the RTP, but not recommended for action are not included in the expenditure estimates.

Operating and Maintenance

A review of the past Transportation Improvement Programs was conducted to estimate the annual programmed funds for system operating and maintenance activities for all transportation modes. Transit fleet and capital improvement estimates are based on average lifespans of equipment.

The following assumptions should be noted.

- Annual estimates do not take into account inflation.
- Off-TIP project funding has been included in the financial element.



Table 6
Revenue and
expenditure forecast.

A. Revenue		Annual Amt.	Total Amt.1998-2020
	Source	(Millions \$)	(Millions \$)
	Federal Highway Funding (Annual Auth. Amount)	42.78	983.94
	State Highway Funding (Annual TIP Auth. Amount)	21.62	497.26
	Current MA Trans. Bond Allocations	n/a	20.00
	Federal, State and Local Transit (include. farebox rev.)	28.7	660.10
	Section 5309 Discretionary Earmark	n/a	30.00
	Total		2,191.30
B. System Expenditures			
	Annual Highway and Bridge Maintenance (see pg. 43)	44.2	1,016.60
	Annual Regional Enhancement Program	4.5	103.00
	Annual ITS Program Investment	2.2	50.60
	Annual Transit Operations & Maintenance	24.1	554.30
	Annual Transit Capital Investment	9.7	223.10
	Sub-Total		1,947.60
Projects		Model Year*	Total Cost
	Rt.5 Bridge Reconstruction Spfld/Agawam	exempt	25.00
	Rte 57 Relocation, Agawam to Southwick	2010	30.00
	I-91 Ramp reversal/ I 291 slip ramp in Springfield	2020	10.00
	Rte 116 Bridge Reconstruction, Chicopee/Holyoke	exempt	20.00
	Rte 21 Bridge Ludlow/Springfield Reconstruction	exempt	15.00
	Rte 10/202 Bridge widening Westfield	2010	18.00
	Calvin Coolidge Bridge widening, Hadley/Northampton	2010	10.00
	Rte 9 widen to 4 lanes, Hadley	2010	2.20
	Elmwood Bypass Holyoke	2020	24.00
	Rte 66 Connector, Northampton	2010	20.00
	Blunt Parkway Connector, Springfield	2010	1.00
	Rte 5 Signal Coordination, Holyoke/W. Springfield	2010	1.00
	Berkshire Avenue Signal Coordination, Springfield	2010	0.75
	Union Station Springfield	2010	40.00
	Multi-Modal/Transfer Center, UMass in Hadley	2020	10.00
	Parking Expansion at PVTA Facility, Springfield	exempt	2.50
	Smart-card Farebox System Installation	exempt	2.00
	Widening & signal coord. Boston Rd., Spfld	2010	1.00
	Widening & signal coord. Parker St., Spfld	2010	1.00
	Signal coord. State St., Spfld	2010	0.75
	I-91 Exit 13B-redesign & realignment, W. Springfield	1999	0.75
	Rte 57 Rotary Bypass Agawam	2020	8.50
	Rte. 9 Bypass in Hadley	Not incl.	N/A
	Light Rail or Bus/HOV Lane on Rte 9, Hadley	Not incl.	N/A
		exempt	N/A
	Sub-Total		243.45
	Total (including maintenance and operation)		2,191.05

• Air quality conformity requires that three build out years be tested. This RTP uses tests for 1999, 2010, & 2020.
This column shows which year the build out scenario has been structured to reflect each project after its completion.

CHAPTER 10

conformity determination

A. INTRODUCTION

Legislative Background

The Commonwealth of Massachusetts is designated as an ozone nonattainment area and classified as "Serious." Also, the City of Springfield is designated nonattainment for carbon monoxide (CO) and not classified. As a result of these designations, the 1990 Clean Air Act Amendments (CAAA) require the Commonwealth to reduce its emissions of volatile organic compounds (VOC) and nitrogen oxides (NOx), the two major precursors to ozone formation, to achieve attainment of the ozone standard by 1999.

The CAAA and the Commonwealth acknowledge that mobile sources are among the major sources of emissions of VOC, NOx and CO. Prior to the 1990 amendments, the majority of pollution control measures focused on stationary industrial sources. The Massachusetts 1993 Emissions Inventory indicates that on-road mobile sources emit approximately 28% of the total VOC, 43% of the total NOx, and 56% of the total CO emissions in the state on a summer day. Mobile source CO emissions on a winter day are approximately 78% of the total state-wide CO emissions.

The Commonwealth revised its State Implementation Plan (SIP) which was submitted to the United States Environmental Protection Agency (EPA) on November 15, 1993. This SIP revision is a strategy of programs that showed Reasonable Further Progress of a 15% reduction of VOC in 1996 toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone by 1999. A large number of the programs target mobile sources, including an enhanced inspection and maintenance program, reformulated gasoline, and California Low Emissions Vehicle Program. It also includes a VOC mobile source emission budget for 1996.

A second major revision to the SIP was submitted to EPA in December 1994. This submission included programs to provide a further reduction of 9% in NOx emissions. NOx reduction credits will be taken from stationary sources through NOx Reasonably Available Control Technology (RACT), and from mobile sources through the Enhanced Inspection and Maintenance Program, the California Low Emission Vehicle Program, and the Tier I Federal Vehicle Standards. A NOx emission budget for 1999 and each year thereafter and a VOC emission budget for 1999 and each year thereafter were included in this submission. In addition, the 1996 VOC budget was revised. EPA approved this SIP submission in the January 30, 1996 Federal Register and was effective on April 1, 1996.

In March of 1997 DEP submitted a 1996 Rate of Progress Report describing the progress to date on the SIP commitments that were submitted to EPA in 1993 and 1994. At that time they had the opportunity to make any revisions and corrections to programs that were submitted to ensure that the ozone air quality standards will be achieved by 1999. As part of the 1996 Progress Report, DEP revised the mobile source emission budget. Previously, the mobile source budget was developed using the Highway Performance Monitoring System (HPMS), using traffic count data from a statistical sampling of roadways to determine vehicle miles of travel in the region. Emissions were subsequently derived from this HPMS data. The new mobile source emission budget was calculated using transportation demand models maintained by the regional planning agencies. In addition, some inputs to the emissions model were changed. They will be detailed in later sections of this conformity determination.

Conformity Regulations

The CAAA also revised the requirements for designated nonattainment Metropolitan Planning Organizations (MPO), to perform conformity determinations for their Regional Transportation Plans (RTPs) and Transportation Improvement Programs (TIPs). Section 176 of the CAAA defines conformity to a SIP to mean conformity to the plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of the standards. The Pioneer Valley MPO must certify that all activities outlined in this RTP will not:

- cause or contribute to any new violation of any standard in any area;
- increase the frequency or severity of any existing violation of any standard in any area; and,
- delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The EPA issued final conformity regulations in the November 24, 1993 Federal Register and the Massachusetts Department of Environmental Protection (DEP) issued new conformity regulations effective December 30, 1994. They set forth requirements for determining conformity of RTPs, TIPs, and individual projects. The requirements of the conformity analysis are summarized below and will be explained in detail in this conformity determination:

Conformity Criteria

- Horizon Years
- Latest planning assumptions
- Latest emission model used
- Timely implementation of transportation control measures (TCM)
- Conformity in accordance with the consultation procedures and SIP revisions
- Public Participation Procedures
- Financially Constrained Document

Procedures for Determining Regional Transportation Emissions

The Conformity Test

- Contribute to reductions in ozone and CO nonattainment areas
- Consistent with emission budgets set forth in SIP

In addition, the regulations set specific requirements for each time period depending on when the state's SIP was submitted to and approved by EPA. These periods are defined below:

Phase II of the Interim Period is the period of time after the effective date of the conformity regulation lasting until submission to EPA of the relevant control strategy implementation plan revisions endorsed by the Governor and subject to public hearing on the date that the CAAA requires the relevant strategy to be submitted. Conformity tests in this period include a build/no build (action/baseline) test and emissions lower than the 1990 base emission budget.

Transitional Period is the period of time after state submission of a relevant control strategy and before approval or disapproval of that strategy by EPA. Under the transitional period criteria, the Transportation Plan and TIP must demonstrate conformity within 18 months of the SIP submission due date to EPA otherwise conformity status will lapse. Conformity tests in this period include consistency with the 1999 VOC emission budget, the 1999 NOx emission budget, and the 1995 through 2010 CO emission budget; build/no build (action/baseline) test, and emissions lower than the 1990 base emission budget.

Control Strategy Period is the period of time after EPA approves the control strategy implementation plan revisions containing strategies for controlling CO and ozone. This period ends when a state submits and EPA approves a request for re-designation to an attainment area. The conformity test in this period is consistency with the mobile source emission budget.

Maintenance Period is the period of time beginning when the Commonwealth submits and EPA approves a request for re-designation to an attainment area, and lasting for twenty years. The conformity test in this period is consistency with the mobile source emission budget.

EPA has been unable to approve the SIP revisions for ozone attainment that were submitted by DEP in 1993 and 1994 because some of the requirements of programs included as control strategies have been changed. Proposed revisions to the 1993 and 1994 SIP submissions include changes in the Inspection and Maintenance Program for automobiles and the Low Emissions Vehicle Program. Once EPA approves the SIP revisions, the control strategy period will begin. However, until that time, Massachusetts remains in the Transitional Period for VOCs and NOx, and for CO in Springfield.

B. CONFORMITY DETERMINATION CRITERIA

This conformity determination has been prepared in accordance with 310 CMR Part 60.03 - Final Massachusetts Conformity to the SIP of Transportation Plans, Programs, and Projects. It shows that this RTP has been prepared following all the guidelines and requirements of the rule.

Horizon Year Requirements

Horizon years for regional model analysis have been established following Section 60.03(22)b of the Massachusetts Conformity Regulations. The years for which the model was run are shown below.

- 1990 Milestone Year - This year has been established as the base year in the SIP for calculation of emission reductions of VOC, NOx and CO
- 1999 Milestone Year Attainment year
- 2010 Analysis Year
- 2020 Analysis Year - Forecast year of transportation plan

Information on CO emissions for the Springfield, CO nonattainment area for the years 2000 and 2005 were determined through interpolation of the modeled data.

Latest Planning Assumptions

Section 60.03(11) of the Massachusetts Conformity Regulations outlines the requirements for the most recent planning assumptions that must be in place at the time of the conformity determination. Assumptions must be derived from the estimates of current and future population, employment, travel, and congestion most recently developed by the MPO. Analyses for the RTP are based on US Census data and information obtained from the Pioneer Valley Regional Data Center, Metropolitan Area Planning Council, Massachusetts Department of Employment and Training, and Massachusetts Highway Department. On August 26, 1996, during a public meeting, the MPO reviewed these assumptions. The following is a list of the sources of data used for the RTP analysis.

Households: Summary Tape File 3 data from the 1990 Census of Population and Housing.

Employment: Town level employment from the Massachusetts Department of Employ-

ment and Training (DET), "Employment and Wages in Massachusetts' Cities and Towns 1981-1990" September, 1991. Traffic analysis zone apportionments based on 1980 Urban Transportation Planning Package (UTPP), United States Department of Transportation (USDOT).

Vehicle Ownership: Summary Tape File 3 data from the 1990 Census of Population and Housing.

Traffic Volumes: Pioneer Valley Planning Commission (PVPC), Regional Data Center, Regional Research Report, "Regional Traffic Counts 1990-1995", September 1996", "A Decade of Regional Traffic Counts 1982-1992", December 1992. (This report includes counts from the Massachusetts Highway Department (MHD), "1991 Traffic Volumes for the Commonwealth of Massachusetts", September, 1992.). Additional traffic counts were conducted by the Pioneer Valley Planning commission staff.

Households Forecasts: PVPC, Regional Data Center, Regional Research Report, "Regional Population Projections, 2000-2020, Pioneer Valley Region, Massachusetts", February 1992. Metropolitan Area Planning Council, "Regional Household Forecast Method", September 1992.

Employment Forecasts: Provided by the PVPC, Regional Data Center, 1993.

Project-Level Data: Provided by the responsible implementing agency.

Transit operating policies of the Pioneer Valley Transit Authority (PVTa) have not changed since the last conformity determination made for the original 1993 Regional Transportation Plan and the 1997-1999 TIP Amendment for the Pioneer Valley Region. Fares were increased as of January 2, 1997, but have not adversely affected ridership.

This RTP will be determining conformity with the Massachusetts SIP mobile source emission budget submitted in March of 1997 for VOC and NOx. The mobile source emission budget for 1999 for the Massachusetts Western Nonattainment Area has been set at 28.417 tons per summer day for VOC and 52.042 tons per summer day for NOx. The 1990 emission inventory for VOCs, NOx, and CO presented in the SIP will also be used. The regional MPO emissions will be combined with the following MPOs/RPAs to show conformity of VOC and NOx emissions with the SIP:

- Berkshire County Regional Planning Commission
- Franklin County Commission

The Executive Office of Transportation and Construction (EOTC) compiled the results from all the MPOs in Massachusetts and the Pioneer Valley MPO has made the final conformity determination for the ozone nonattainment area.

Latest Emissions Model

Emission factors used for calculating emission changes were determined using MOBILE 5A-H, the model used by the Department of Environmental Protection (DEP) in determining the mobile source budget. Emission factors for motor vehicles are specific to each model year, pollutant type, temperature, and travel speed. MOBILE 5A-H requires a wide range of input parameters including inspection and maintenance program information and other data such as anti-tampering rates, hot/cold start mix, emission failure rates, vehicle fleet mix, fleet age distribution, etc.

The input variables used in this conformity determination were received from DEP. The inputs used for the 1990 base network were the same as those used in determining the 1990 Emissions Inventory for the Commonwealth of Massachusetts. The inputs used for the years 1999 through 2020 were also received from DEP and include information on programs that were submitted to EPA in 1993, 1994, and 1997 as the control strategy for the Commonwealth to obtain ambient air quality standards for 1999.

These input variables were determined through the consultation procedures as required by the conformity regulations. The model output provides an estimate of emissions in grams per mile for varying speeds and at varying temperatures for a variety of vehicle types.

Timely Implementation of Transportation Control Measures (TCMs)

Transportation control measures (TCMs) have been required in SIP revisions submitted to EPA in 1979, 1982 and those submitted as mitigation for the construction of the Central Artery project in the Boston Metropolitan Area. Those TCMs included in the 1979 and 1982 submission for implementation in the Pioneer Valley Region have all been accomplished through construction or through implementation of ongoing programs. These projects have all been included in past Pioneer Valley MPO Transportation Plans and TIPs.

DEP has submitted to EPA their strategy of programs to show Reasonable Further Progress of a 15% reduction of VOC in 1996 and the further 9% reduction of NO_x toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone in 1999 to EPA. Within that strategy, there are no specific TCM projects. They do call for traffic flow improvements to reduce congestion and, therefore, improve air quality. The RTP has proposed projects for this purpose. Other transportation-related projects that have been included in the SIP control strategy are listed below.

- Enhanced Inspection and Maintenance Program.
- California Low Emission Vehicle Program.
- Reformulated Gasoline for On and Off-Road Vehicles.
- Stage II Vapor Recovery at Gasoline Refueling Stations.
- Tier I Federal Vehicle Standards.

Consultation Procedures

The final conformity regulations require that the MPO must make a conformity determination according to consultation procedures set out in the final federal regulation and state DEP conformity regulation and it must also follow public involvement procedures established by the MPO under federal metropolitan transportation planning regulations.

The consultation requirements of both the state and federal regulations require that the Pioneer Valley MPO, EOTC/Bureau of Transportation Planning and Development (BTP&D), DEP, EPA - Region 1, Federal Highway Administration (FHWA) - Region 1, and Federal Transit Administration (FTA) - Region 1 consult on the following issues:

- Selection of regional emissions analysis models including model development and assessing project design factors for modeling;
- Selection of inputs to the most recent EPA-approved emissions factor model;
- Selection of CO hotspot modeling procedures, as necessary;
- Identification of regionally significant projects to be included in the regional emissions analysis;
- Identification of projects which have changed in design and scope;
- Identification of exempt projects;
- Identification of exempt projects that should be treated as non-exempt because of adverse air quality impacts; and,

- Identification of the latest planning assumptions and determination of consistency with SIP assumptions

These issues have all been addressed through consultation of the agencies listed above. These meetings were held on January 22, 1997 and February 12, 1997.

Public Participation

Title 23 CFR Section 450.324 and 310 CMR 60.03(6)h require that the development of the RTP provide an adequate opportunity for public review and comment.

Section 450.316(b) establishes the outline for MPO public participation programs. The Pioneer Valley MPO developed a Public Participation Process that provides complete information, timely public notice, full public access to key decisions, and opportunities for early and continuing involvement. The development and adoption of this program conforms to the requirements of the section. It guarantees public access to the RTP and all supporting documentation, provides for public notification of the availability of the RTP and the public's right to review the document and comment thereon, and provides a 30-day public review and comment period prior to the adoption of the RTP by the MPO.

On February 17, 1996 and March 19, 1997, public notices were advertised in the Springfield Union News and Daily Hampshire Gazette and other newspapers informing the public of its right to comment on the document. On April 9, 1997, the Pioneer Valley Joint Transportation Committee recommended that the MPO endorse the RTP and conformity determination as amended. Consequently, on April 30, 1997, the Pioneer Valley MPO voted to approve the RTP and conformity determination. This allowed ample opportunity for public comment and MPO review of the draft document. These procedures comply with the associated federal requirements.

Subsequent to adoption of the 1997 Transportation Plan by the MPO, a new mobile source emission budget became effective for the nonattainment area. Although the conformity regulations allow up to 18 months to find conformity of the Plan to a new emission budget, it is necessary to make a new conformity finding prior to adoption of the new 1998 TIP. This will allow the TIP to come from a conforming RTP.

The analysis shows that the conformity finding does not change from the finding that was sent out for public notice in March and April of this year. The only actual changes are the total emissions and the emission budgets. This change does not affect the financial constraint or recommendations of the RTP.

Fiscal Constraint

Title 23 CFR Section 450.324 and 310 CMR 60.03(9) require the RTP to be "financially constrained by year and include a financial plan that demonstrates which projects can be implemented using current revenue sources and which projects are to be implemented using proposed revenue sources (while the existing transportation system is being adequately operated and maintained)." Moreover, new regulations have further defined financial constraint so as to exclude a state's unspent federal balances. Projects can now only be programmed up to an amount that the Congress is expected to allow a state to spend in any individual fiscal year.

The overall RTP, and each fiscal year contained herein, is financially constrained to the annual federal apportionment and projections of state resources reasonably expected to be available during the appropriate time-frame. Projections of federal resources are based upon the estimated apportionment of the federal authorizations contained in ISTEA, as allocated to

the region by the state or as allocated among the various MPOs according to federal formulae or MPO agreement. Projections of state resources are based upon the allocations contained in the current Transportation Bond Bill and historic trends. Currently existing or accruing state and local revenues are estimated to be sufficient to operate and maintain the current transportation system.

Federal financial resources for transit are projected using appropriated amounts provided by the Federal Transit Administration (FTA) for the funding categories of Sections 5307 and 5311. Section 5309 is based on estimates of what will be reasonably available. Due to the discretionary nature of these categories, project line items are maintained in the second or third year of the TIP until an actual grant award is tendered. Section 5310 is programmed through the state and is awarded on a discretionary basis. Projections are based on past experience and the funding level provided by the State. Therefore, the 1997 Transportation Plan substantially complies with federal requirements relating to financial constraints.

C. PROCEDURES FOR DETERMINING REGIONAL TRANSPORTATION EMISSIONS

The final conformity regulations set forth specific requirements for determining transportation emissions. A summary of these requirements and the procedures used in this Plan are summarized below.

Specific sources of population, employment and traffic information used have been listed above. Section VI of the 1997 RTP documents the transportation demand model used for the conformity determination analysis. Section VII of this Transportation Plan presents conditions and characteristics of the existing regional transportation system.

Section VII of the Transportation Plan, discusses trends and changing demands that various components of the transportation system will serve in the future years. It discusses the future roles of the highways, transit, pedestrian and bicycle travel and water travel. It also describes the development and evaluation of alternative scenarios that were analyzed to help determine the final recommendations of the Transportation Plan.

Section VIII of the Transportation Plan outlines the specific project recommendations that are set forth in the Transportation Plan for the Pioneer Valley MPO Region through the year 2020. Table 5 presents the time periods for implementation for each project. The recommended projects have been included in the Baseline and Action networks for the analyses performed for the conformity determination of this RTP.

Only regionally significant projects are required to be included in the regional modeling efforts. The final federal conformity regulations define regionally significant as follows:

Regionally significant: a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sport complexes, etc., or transportation terminals as well as most terminals themselves) and would be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

In addition, specific projects have been exempt from regional modeling emissions analysis. The categories of projects include:

- Intersection channelization projects;
- Intersection signalization projects at individual intersections;
- Interchange reconfiguration projects;

- Changes in vertical and horizontal alignment;
- Truck size and weight inspection stations; and,
- Bus terminals and transfer points;

The Baseline and Action Networks are composed of projects proposed in approved TIPs, the 1997 Transportation Plan, and projects in the PVTa capital budget. Projects in the Baseline networks consist of the 1990 network plus all projects where one of the following steps has occurred within the last three years:

- Comes from first three years of the previously conforming TIP;
- NEPA process completion;
- Start of final design;
- Acquisition of a significant portion of right-of-way; and,
- Approval of plans, specifications, and estimates.

A listing of the projects that meet these criteria and are included as part of the 1999 Baseline network is shown below. These projects include:

- Palmer, intersection improvements at Route 20 and 181, Shearer's Corner;
- Chicopee, construction of a bridge over Chicopee River, connect with Route 41;
- Holyoke/South Hadley, construction of a bridge over Conn. River, Routes 116/141;
- Agawam, construction and relocation of Rte 57, East Phase;
- Springfield, construction of new bridge over Chicopee River;
- Holyoke, expansion of the Holyoke Mall and intersection improvements;

The 1999 Action Network includes all projects in the 1999 Baseline and all new 1997, 1998 and 1999 TIP projects. Those projects include the following:

- West Springfield, widening and signalization of I-91 Exit 13B
- Springfield, signals at Page-Berkshire, Cottage-Berkshire, Harvey-Berkshire, Wilbraham-Bradley

The 2010 and 2020 Action Networks are the same as their respective Baseline Networks plus the following regionally significant projects:

- Agawam, Rte 57 relocation from Rte 187 to Southwick town line;
- Holyoke, construct Elmwood Bypass, from Rte 391 to Lower Westfield Road;
- Holyoke/West Springfield, Rte 5 signal coordination;
- Springfield, Blunt Parkway Connector between Roosevelt Avenue and Bay Street;
- Westfield, Rte 10/202 bridge widening over Westfield River;
- Hadley, widen Rte 9 to four lanes from West Street to Coolidge Bridge;
- Hadley/Northampton, rehabilitation of the Coolidge Bridge (lane addition);
- Northampton, construct roadway from Old South Street to Route 66;
- Springfield, Berkshire Avenue signal coordination;
- Ludlow/Springfield, Route 21 Bridge reconstruction;
- Springfield, construct a new off ramp from I-291 to East Columbus Avenue;
- Springfield, reverse the direction of four existing I-91 ramps;
- Agawam, construct a slip ramp from the South End bridge to Route 57 west;
- Springfield, improvements to Parker Street;
- Springfield, Boston Road signal coordination; and
- Springfield, State Street signal coordination.

In addition to emissions calculated from the network model, a separate analysis was performed off-model to determine emissions from the Pioneer Valley Transit Authority (PVTa) bus purchases, the installation of two Park and Ride lots and Express Bus Service along Route 9, a proposed ITS monitoring project on Route 9, and for two Intermodal Transportation Centers in the Pioneer Valley region (One at Union Station in Springfield and one at UMass).

Additional off-model analysis was performed for a total of 20 traffic signal improvement projects included as part of Pioneer Valley's 1997-1999 TIP.

The State conformity regulations require that any changes in project design from the previous conformity determination for the region be identified. The last conformity determination was performed on the 1997-1999 TIP. Changes which have occurred since this last conformity determination are as follows:

DEP has revised the mobile source emission budgets for VOCs and NOx to calculate growth in VMT with the transportation demand model rather than HPMS. Therefore the RTP will be determined conforming with new VOC and NOx budgets.

Section 310 CMR 60.03(26) of the Massachusetts regulations, outlines requirements to be used in the network-based transportation demand models. These requirements include modeling methods and functional relationships to be used in accordance with acceptable professional practice and are reasonable for purposes of emission estimation. The MPO has used the methods described in the conformity regulations in the analysis of this RTP.

Information was seasonally adjusted using factors developed by MHD to reflect summer and winter traffic conditions. The DVMT was adjusted by a factor of 1.0188 to reflect summer conditions for calculations of emissions of VOC and NOx. VOC and NOx are precursors of ozone which is a pollutant of concern during the summer months. The DVMT was adjusted by a factor of 0.9812 to reflect winter conditions for calculations of CO. CO emissions from mobile sources are higher during the colder winter months.

As stated in guidance by EPA, all areas of serious ozone and CO nonattainment must use the Federal Highway Administration's HPMS to track VMT prior to attainment to ensure that the state is on line with commitments made in reaching attainment of the ambient air quality standards by the required attainment dates. MassHighway provides HPMS information to DEP. DEP used this information in setting mobile source budgets for VOCs, NOx, and CO in all SIP revisions prior to 1997. DEP has since revised its VOC and NOx budgets using transportation demand model runs. However, the models must still be compared to HPMS data since HPMS is the accepted tracking procedure set forth by EPA.

The conformity regulations require that all model based VMT be compared with the HPMS VMT to ensure that the region is line with VMT and emission projections made by DEP. An adjustment factor has been developed which compares the 1990 HPMS VMT to the 1990 transportation model VMT. This adjustment factor is then applied to all modeled VOC and NOx emissions for the years 1999 through 2020 to ensure consistency with EPA accepted procedures.

Table 7

Adjustment factors=1990 HPMS
VMT/1990 Modeled VMT

Emission	HPMS Method (miles)	Model Method (miles)	Future Yr. Adjust. Factor
VOC & NOx	13,391,000	10,505,016	1.275

D. ALTERNATIVE PROCEDURE FOR DETERMINING REGIONAL TRANSPORTATION EMISSIONS-LAND USE/TRANSPORTATION MODELING FOR THE PIONEER VALLEY

In 1996 the Pioneer Valley Planning Commission began updating its Regional Land Use Plan for the first time since 1978. The following is a description of the methodology and results from a alternative regional transportation model that includes the land use projections made in the draft Regional Land Use Plan. In order to input the projected land use data into the regional transportation model, a method was developed to translate the acreage numbers of the different land uses into socioeconomic data including the number of retail employees, non-retail employees, and dwelling units in each census block group. These three socioeconomic numbers were then input and run in a new 2020 action model to show the influence of land use planning on vehicle miles traveled and projected air quality emissions for the region.

The Regional Land Use Plan divides the Pioneer Valley Region into ten land use categories. (See below for the description of each category). Acreage numbers for each land use category were assembled for each Census Block Group which corresponds to the Traffic Analysis Zones in our transportation modeling network. Next, methodologies were developed for each land use category to project how much of the land would be developed and for what uses (residential, commercial, etc.) by the year 2020. Using these assumptions to boil down the raw acreage numbers, calculations were applied to find projected employment data and the acreage numbers were divided by average residential lot sizes for different areas to find the increase in dwelling units. In many cases there were different assumptions for both urban and rural areas.

The following table shows how the new socioeconomic data that was translated from land use projections influenced the Pioneer Valley 2020 Action transportation model for overall vehicle miles traveled and air quality emissions. This alternative air quality analysis is only used to demonstrate how land use planning can impact regional air quality through emissions from transportation and is not used to officially determine conformity with the Massachusetts State Implementation Plan (SIP).

Table 8
Impact of land use planning on vehicle miles traveled and air quality emissions for the Pioneer Valley 2020 action model.

	2020 Baseline	2020 Action Original Model		2020 Action Land Use Model	
		Data	%Change**	Data	%Change**
VMT	12,624,289.49	12,680,423.39	0.35%	12,116,914.74	-4%
	9	39		74	
VOC (tpsd)*	7.37	7.4	0.43%	7.01	-5%
NO _x (tpsd)*	15.45	15.52	0.43%	14.88	-4%
CO (tpsd)*	57.28	57.49	0.37%	54.37	-5%

*Emissions are in tons per summer day

**%Change is the percentage of each 2020 Action Model compared to the 2020 Baseline

Note: Emission data is essentially adjusted but not HPMS adjusted and does not include off-model projects.

Subsequent to the adoption of the 1997 Transportation Plan by the MPO, a new mobile source emission budget became effective for the nonattainment area. This resulted in changes to the emissions factors used in the air quality analysis of the Regional Land Use Plan. Table 8 does not reflect the changes anticipated as a result of this latest revision to the emissions budget, however, the overall percentage change is expected to remain consistent with the numbers shown above.

E. THE CONFORMITY TEST

The Pioneer Valley MPO has conducted an air quality analysis of the 1997 Transportation Plan. The purpose of the analysis is to evaluate the RTP's air quality impacts on the Massachusetts SIP. The analysis evaluates the change in ozone precursor (VOCs and NOx) emissions and carbon monoxide emissions in Springfield due to implementation of the RTP. The modeling procedures and assumptions utilized in this air quality analysis follow the EPA's final conformity regulations issued on November 24, 1993 and the State Conformity Regulations effective December, 1994. They are also consistent with procedures used by the Massachusetts Department of Environmental Protection to develop Massachusetts' 1990 Base Year Emission Inventory, 1996 Reasonable Further Progress Plan, the Post-1996 Reasonable Further Progress Plan, and the 1996 Rate of Progress Report for the SIP. All consultation procedures were followed to ensure that a complete analysis of the Plan was performed with consistency with the SIP.

One of the criteria for conformity to a SIP in the transitional period is to show that there is a reduction in emissions in the action (build) scenario over the baseline (no build) scenario. As discussed earlier, the Western ozone nonattainment area consists of three metropolitan planning areas. The Executive Office of Transportation and Construction has compiled the results for VOC and NOx from these MPOs and are displayed in Tables 9 and 10. The results of the air quality analysis from the Western Massachusetts ozone nonattainment area have been completed by EOTC and demonstrate that the Action scenarios will result in a reduction of VOC and NOx emissions when compared to the Baseline scenarios. The Pioneer Valley MPO must also report CO emissions because of the CO Nonattainment status of the City of Springfield. This information is displayed in Table 10.

All scenarios must contribute to a reduction in emissions from 1990 baseline emissions. As shown in Tables 9 and 10, the Western nonattainment area VOC and NOx emissions for all years, 1999 through 2020, meet this criterion, as well as the CO emissions for the CO nonattainment area within the Pioneer Valley MPO region, and, therefore, contribute to reductions in VOCs, NOx, and CO in the nonattainment area.

Table 9

RTP-conformity determination
western massachusetts ozone
non-attainment area emissions
estimates.

Year/ Pollutant	Baseline	Action	1990 Inventory	SIP Budget
1999 VOC	28.453	28.375	62.529	28.417
NOx	52.055	52.037	74.464	52.042
2010 VOC	18.905	18.780	62.529	28.417
NOx	43.004	42.989	74.464	52.042
2020 VOC	19.257	19.097	62.529	28.417
NOx	44.759	44.749	74.464	52.042

Sources: Bureau of Transportation Planning Development

Pioneer Valley Region Travel Model-Baseline and Action Data

Note: Volatile Organic Compounds (VOC), Nitrogen Oxides (NOx), Ozone precursor emissions in Tons Per Summer Day (TPSD).

Table 10

RTP conformity determination
Pioneer Valley region ozone
non-attainment area
City of Springfield co non-attainment
area emissions estimates.

Year/ Pollutant	Baseline	Action	1990 Inventory	SIP Budget
1999 VOC	18.389	18.321	40.340	28.417
NOx	32.065	32.035	45.692	52.042
(Spfd) CO	48.675	48.471	91.84	-
2010 VOC	12.348	12.230	40.340	28.417
NOx	26.851	26.829	45.692	52.042
(Spfd) CO	38.479	37.605	91.84	-
2020 VOC	12.594	12.441	40.340	28.417
NOx	27.974	27.958	45.692	52.042
(Spfd) CO	38.720	38.643	91.84	-

Sources: Bureau of Transportation Planning Development

Pioneer Valley Region Travel Model-Baseline and Action Data

Note: Volatile Organic Compounds (VOC), Nitrogen Oxides (NOx), Ozone precursor emissions in Tons Per Summer Day (TPSD).

The final test of conformity is to show that the 1997 RTP is consistent with the emission budgets set forth in the SIP. The Massachusetts Reasonable Further Progress Plan (RFP) has been deemed complete by EPA in a letter dated June 18, 1997. EPA has made a determination that the 15% RFP SIP submittal contains an adequate mobile source emissions budget to conduct conformity determinations using the "transitional period" conformity criteria.

The 1999 NOx budget is 52.042 tons per summer day and the 1999 VOC budget is 28.417 tons per summer day.

The total tons per day of VOCs and NOx for the nonattainment area from all of the analyzed scenarios are shown in Tables 9 and 10. The results of the air quality analysis demonstrates that VOC and NOx emissions from all Action scenarios are less than the VOC and NOx emission budgets.

F. CONCLUSION

The Clean Air Act Amendments of 1990 established new requirements for transportation plans, programs, and projects. EPA published a final rule in the November 24, 1993 Federal Register on procedures to be followed by the United States Department of Transportation in determining conformity of transportation plans, programs, and projects with the SIP. The Commonwealth of Massachusetts also published their final rule on conformity effective December 30, 1994.

The Pioneer Valley MPO has conducted an air quality analysis of the RTP. The purpose of the analysis is to evaluate the RTP air quality impacts on the SIP. The analysis evaluates the

change in ozone precursor emissions (VOC, and NOx) and CO emissions due to the implementation of the RTP. The modeling procedures and assumptions used in this air quality analysis follow EPA's and the Commonwealth's guidance and are consistent with the procedures used by the Massachusetts DEP to develop Massachusetts' 1990 Base Year Emissions Inventory, 1996 Reasonable Further Progress Plan, the Post-1996 Reasonable Further Progress Plan, and the 1996 Rate of Progress Report for the SIP.

Western Massachusetts is designated as an ozone nonattainment area and classified as "Serious." The City of Springfield is designated nonattainment for carbon monoxide and not classified. The EPA conformity regulations require that transportation plans, programs, and projects evaluate their impact on nonattainment areas. The Western Massachusetts Nonattainment Area is made up of three regional planning agencies (RPAs), therefore VOC and NOx emissions must be combined in order to compare the results to the conformity criteria.

EPA has found the base year emissions inventories, the 15% Plan, the 9% Plan, and the contingency submittal administratively and technically complete in a letter dated June 5, 1997. This established the new mobile source emission budgets for which the new conformity determinations will be based. In addition, EPA has made a conditional interim approval of the Massachusetts 15% Rate of Progress Report and Contingency Plan in a letter dated June 18, 1997.

Accordingly, the EOTC has found the emission levels from the Pioneer Valley MPO 1997 Transportation Plan in combination with the emission levels from the other RPAs in Western Massachusetts to be in conformance with the SIP according to transitional period conformity criteria. Specifically, the following conditions are met.

- In the transitional period, VOC and NOx emissions for the western ozone nonattainment area for the Action (Build) scenario are less than the Baseline (No Build) scenario for all analysis years.
- CO emissions for Springfield for the Action (Build) scenario are less than the Baseline (No Build) scenario for all analysis years.
- The VOC emissions for the Action (build) scenarios are less than the 1999 VOC mobile source emission budgets for analysis years 1999 through 2020.
- The NOx emissions for the Action (build) scenario are less than the 1999 NOx mobile source emission budget for analysis years 1999 through 2020.
- The Action (Build) scenarios contribute to a reduction from the 1990 emissions inventory for VOC, NOx, and CO emissions for all analysis years.

In accordance with Section 176(c)(4) of the Clean Air Act as amended in 1990 [42 U.S.C. 7251 (a)], the MPO has completed its review and hereby certifies that implementation of the Pioneer Valley MPO 1997 Regional Transportation Plan satisfies the conformity criteria specified in 40 CFR Parts 51 and 93 (November 24, 1993) and in 310 CMR 60.03 (December 30, 1994), and is consistent with the air quality goals of the existing Massachusetts State Implementation Plan.



Appendix A
RTP Support Documents



Executive Summary of Transit 1990's: A Strategic Plan for the Next Decade

Transit 1990's was created as a joint effort of the Pioneer Valley Planning Commission and the Pioneer Valley Transit Authority in order to study how public transportation services in the Pioneer Valley can be improved to suit future growth. The Transit 1990's Task Force examined the level and availability of transit service within the Pioneer Valley and its relationship to population projections and future needs assessments.

A comprehensive set of recommendations were developed by the task force to help guide the regional transit system over the next decade. The task force recommended that the PVRTA:

- Ensure that revenues equal expenditures by designing and planning services with realistic annual financial projections;
- Continue to engage the services of PVPC for transit planning, to help ensure that transit planning is an integral part of the region's comprehensive transportation planning process;
- Decide whether to shift the financial burden onto its riders through fare increases or shrink the route system while losing a minimal number of riders but retaining the bulk of the rider base;
- Review policies relative to providing services to private properties or businesses;
- Review ridership figures to determine where appropriate, an increase in frequency, hours and days of service specific routes should run based on consumer needs;
- Examine individual fixed routes to determine the times of peak ridership and tailor the size of vehicles to the route peak and off-peak ridership levels;
- Establish, on a trial basis, express buses and expand its park-and-ride programs if there exists sufficient demand and fiscal resources;
- Establish transit centers at the sub-regional hubs where linkages between local buses, express buses, paratransit, intercity buses, and taxis would be developed;
- Study the feasibility of light rail transit to connect Amherst, Northampton, Holyoke, Chicopee, and Springfield, possibly extending to Enfield and Bradley International Airport;
- Expand special transportation services for elders in order to meet current needs and to keep pace with the projected increase in numbers of this population, and;
- Combat the decline in its ridership by instituting and maintaining a marketing effort that promotes ridership, increases PVRTA's advertising and promotional revenues.

Executive Summary of the Route 9 Corridor Study

The Route 9 Corridor Study Area is aligned in a generally southwest to northeast direction for a distance of approximately five miles, from Damon Road in Northampton, across the Connecticut River, and through the Town of Hadley to University Drive in Amherst. Route 9 is the principle east/west arterial highway in the northern part of the Pioneer Valley region.

The Route 9 Corridor study began as a result of the increasing incapacity of Route 9 to handle the volumes of traffic that regularly utilize it between Northampton and Amherst. The study identifies both short term and long term improvements to the existing highway. Some recommendations made within the plan include:

- Modifying the signal timing at Route 9 and Damon Road
- Widening and restriping Damon Road in the southbound direction for exclusive left/right turn lanes
- Opening Old Bay Road one-way for eastbound traffic to provide direct access to Bay Road;
- Creating traffic movement restrictions at the West Street intersection with Route 9;
- Installing a traffic signal at the intersection of East Street and Route 9;
- Creating traffic movement restrictions at the Bread and Circus entrance to and from Route 9 by providing signage;
- Installing continuous right-turn lanes where there is a high frequency of driveways joining Route 9;
- Improving transit passenger amenities such as providing bus shelters and increasing bus shelter size;
- Developing commuter alternatives such as discouraging single-occupant automobile usage, encouraging employer-sponsored carpooling and vanpooling and instituting an alternative work hours program;
- Modifying the Calvin Coolidge Bridge by widening it to four lanes, adding a sidewalk, and building a shoulder/bike lane;
- Widening Route 9 to four lanes between the Calvin Coolidge Bridge and West Street in Hadley;
- Developing either a two lane or four-lane diversion between the Calvin Coolidge Bridge and West Street; and,
- Investigating the feasibility of constructing rail transit to parallel Route 9.

Executive Summary of A View of Our Valley-1993

The View of Our Valley publication is the third statistical guide published by the Pioneer Valley Planning Commission since 1977. It consists of four major sections, containing information about employment trends, population characteristics, transportation and other socioeconomic characteristics. Each section is published individually and is available as a separate report. Collectively, the entire publication offers a comprehensive view of the Pioneer Valley Region.

The population of the Pioneer Valley Region increased by 3.6% between 1980 and 1990. This compares to a 4.9% increase for the Commonwealth of Massachusetts, 7.0% for New England, and 8.2% for the United States. The projected rates of population change are smaller than those experienced during the 1980's, with an increase of 2.6% from 1990 to 2000, 0.7% from 2000 to 2010, and 1.2% from 2010 to 2020. This rate of growth is due to relatively low birth rates which are expected to continue into the future as well and a lack of substantial in-migration.

The market trends examined in the next statistical guide examined housing sales in the Pioneer Valley Region from 1988 to 1992. During this time, the total number of residential sales in Hampden County dropped by 35 percent. In contrast, the total value for homes sold in Hampshire County dropped by 25 percent within the same time period. Retail trade establishments increased 14% between 1980 and 1990. The largest growth was seen in the classification of Eating and Drinking Establishments, which increased by 31%, while General Merchandising retail establishments decreased by 10% during the same time period.

In January 1990, within the Pioneer Valley region, 291,938 citizens participated in the labor force of the total 1990 population of 602,878. The unemployment figure during the same time period was 10,571. During the next two years this number climbed to 19,444 in January 1992, resulting in a greater than 45 percent increase in the unemployment rate. The actual percentage rate rose from 4.91 percent in January 1990 to 9.03 percent in January of 1992.

In general, traffic on the region's roadways has been increasing as also experienced statewide and nationally. Between 1980 and 1990 the estimated number of daily vehicle miles traveled (DVMT) in the Springfield-Chicopee-Holyoke urbanized area rose from 7.4 million to 9.4 million. The Average Daily Traffic (ADT) increases realized over the last decade likely represent a permanent shift from a higher level of traffic volume and vehicle activity.

Executive Summary for the Route 5 Corridor Study

From September 1990 to December 1991, the Pioneer Valley Planning Commission studied traffic and land use conditions along a segment of Route 5 that begins at the rotary intersection with Route 20 in West Springfield northerly through the West Springfield/Holyoke municipal boundary to the Beech Street intersection in Holyoke. Before the construction of Interstate 91, Route 5 served as one of the main north-south routes through the Pioneer Valley. The corridor study area focused on land uses directly adjacent to the Route 5 corridor, and zoning districts whose primary access to the region was through Route 5.

Trends in land development and traffic growth were identified, and their impacts on the capacity of the roadway in the corridor were analyzed. In addition, projections of future development were made, and estimates of future traffic patterns were then derived, which were evaluated to determine if the corridor could accommodate future traffic. Some of the recommendations developed for this study include:

- Establish a Route 5 Corridor Planned Business Zone;
- Protect environmentally-significant land parcels in the Route 5 Corridor;
- Require traffic impact statements for larger developments and high-traffic volume generating uses;
- Control infill development in existing large commercial shopping centers;
- Adopt trip reduction plan requirements;
- Establish access standards;
- Upgrade local sign regulations;
- Improve municipal parking and landscaping regulations;
- Strengthen buffer requirements for buffers between commercial or industrial districts and residential districts;
- Upgrade parking lot landscaping requirements;
- Develop or improve pedestrian sidewalks and bicycle paths;
- Continue the operation of the Route 5 Corridor Advisory Committee;
- Provide for pedestrian safety in the Route 5 Corridor, and;
- Establish standardized development fees.

Executive Summary for the Pioneer Valley Plan for Progress-Economic Strategies for the Region-September 1994

"Economic development is a partnership" is the basic premise found within the document entitled: Plan for Progress, and economic strategy plan for the Pioneer Valley Region. The principles outlined within this plan have been expanded upon those introduced in Choosing to Compete, and economic strategy for Massachusetts, published by the Executive Office of Economic Affairs in 1993.

The recent restructuring of both the local and global economy is unprecedented. In order for the Plan for Progress to truly reflect the economic issues facing the region, information and comprehensive involvement from the community were needed. A series of economic summits, community outreach sessions were scheduled, and numerous goals and strategies were developed through these sessions. Short term, mid term, and long term strategies were developed to help implement the recommendations made.

Some of the strategies developed within the plan are dependent on the transportation network that exists within the Pioneer Valley region. Strategies aimed at keeping existing industries and attracting new business to the area, expanding regional tourism efforts, and promoting regional identity are highly dependent on a suitable transportation network. In addition, capitalizing on existing telecommunications capabilities, adopting strategies outlined in the Connecticut River 2020 Master Plan, maximizing the economic impacts of Westover and Barnes Airports, and developing future high speed ground transportation.

Executive Summary of the 1994 Major Employers Inventory for the Pioneer Valley Region

The 1994 Major Employers Inventory for the Pioneer Valley Region highlights employment changes that have occurred within the Pioneer Valley Region between 1989 and 1994. The employment data presented in the inventory focuses only on those employers that have 50 or more full time employees. Individuals working in the public sector, namely, for a city, town, school, or other department of local government were considered employees of single employers. Data for the inventory was collected from the U.S. Census Bureau, the Massachusetts Department of Employment and Training (MA-DET) along with information attained from telephone interviews with a representative from each enterprise or government unit conducted between July 1994 and January 1995.

Census Bureau data collected by the National Economic Census, unemployment insurance and payroll tax data collected by state agencies revealed that the number of employees for the region has dropped 9.7% between 1989 and 1992 within all economic sectors. Overall, 39% of persons are employed by Major Employers in the Pioneer Valley Region, ranging from 0% in communities such as Pelham and Southampton, to 70% in Amherst, 62% in South Hadley, and 52% in Chicopee. In addition, just under 3% of the employers can claim just under 40% of employees in the Pioneer Valley Region.

Springfield has more major employers than any other community, with 110 major employers, while the communities with the fewest major employers are Granby, Hampden, Huntington, and Russell each having one major employer.

The data presented in the balance of the report focused on information found in the major employers directory created by PVPC staff. The directory contains the total number of full and part time employees, daily schedules, and the nature of the work or business conducted at a particular employment location. In total, there are 395 major employers listed within the Pioneer Valley region employment directory as determined by the PVPC.

Executive Summary of Data Digest-A Statistical Profile of the Pioneer Valley Region

Data Digest: A Statistical Profile of the Pioneer Valley Region is a series of informative pamphlets that focus on different socioeconomic and demographic characteristics within the information presented within the Data Digest has been compiled from the Census and from various studies undertaken by the staff at PVPC. Often, requests are made regarding various demographic characteristics in the area from both public and private organizations and the most frequent data requests are then published into a data digest. The topics discussed within the latest editions of the Profile include: Population Trends, Journey to Work statistics, and Employment Projections for the 1991-2005 period.

The data digest entitled: The Region's Changing Population, briefly describes the growth "hot spots" within the Pioneer Valley Region, in addition to the ethnic and racial diversification of the Pioneer Valley Region, future population projections and household size. The Journey to Work data digest highlights statistics and data pertaining to the predominant locations individuals travel to for employment, where population growth and job migration trends have occurred, which roads contribute to commuter travel, and what the average commuting time is for each community in the Pioneer Valley Region.

The third data digest recently released by PVPC discusses employment projections traces overall employment trends within the Pioneer Valley Region between 1991 to 2005. Data presented within the Digest traces total employment from 1972 to employment projections made to the year 2005. Employment sectors featured in the digest include: the service, wholesale and retail trade, finance, insurance, and real estate, contract construction, manufacturing, transportation, communications and utilities, and government. In addition, major employment centers within the Pioneer Valley Region are graphically depicted within this digest.

Executive Summary The Vehicle Miles Traveled (VMT) Reduction Workbook- September 1995

The Pioneer Valley Vehicle Miles Traveled (VMT) Reduction Workbook presents a collection of tools for planners and other community organizers to use in promoting development patterns that minimize vehicle use, vehicle trips generated and improve air quality within the Pioneer Valley. It focuses on land use planning strategies for creating an environment conducive to walking, bicycling and public transit.

The VMT Reduction Workbook highlights a number of strategies that can be used by communities in the Pioneer Valley to ensure that development patterns and other land use characteristics promote reduced vehicle use. Some policy objectives presented in the Workbook include efforts to:

- Promote the efficient use of vehicles and increase vehicle occupancy through the creation of partnerships with local employers to develop carpooling, vanpooling and shuttle programs;
- Assist communities in the development of park and ride lots near transit lines;
- Encourage more employer-based programs for telecommuting and alternate work hours;
- Improve the operation of transit and increase transit use by encouraging higher land use densities and mixed use areas near transit lines;
- Improve transit stops by adding amenities such as lighted bus shelters, benches and adequate automobile and bicycle parking at transit stops;
- Improve access and increase pedestrian and bicycle activity through landscaping, seating, providing shade trees and constructing sidewalks;
- Promote reduced vehicle use during non-work trips through compact development and mixed uses, and;
- Promote improved quality of life in community centers through maintaining clean and safe public open spaces, promoting cultural activities and other forms of entertainment, and increasing after business and evening shopping hours.

Executive Summary of the Boston Road Corridor Study

The Boston Road Corridor Study Area extends from the intersection of Breckwood Boulevard and Boston Road in Springfield easterly to the convergence of Route 20 (Boston Road) at the Boston Road and Pasco Road intersection through the Springfield-Wilbraham municipal boundary to the Wilbraham/Palmer town line. The Boston Road Corridor study began in June of 1994 in response to existing transportation and safety problems resulting from intense development along the corridor.

The corridor serves as a major retail resource for the region and provides many services to local residents in both municipalities. The proximity of the corridor to the major interstate transportation routes, Route 291 and Route 90 has recently encouraged development. This study examined the existing land use and traffic conditions and what impacts future development would have along the corridor. Recommendations suggested within this study pertain to the communities of Wilbraham and Springfield individually, as well as collectively and the:

- Creation of a planned mixed use development zone;
- Development of a network of bicycle/pedestrian circulation paths;
- Upgrade of local sign regulations;
- Refinement of municipal parking and landscaping regulations;
- Enhancement of performance standards for commercial and industrial uses;
- Encouragement of transit use;
- Identification of sites for urban infill redevelopment;
- Adoption of a site plan approval procedure;
- Expansion of sewer capacity; and,
- Creation of a river protection district.

Executive Summary of the Pioneer Valley Planning Commission Web Page

In 1996 the Pioneer Valley Planning Commission went "on-line" with the establishment of a new website, www.pvpc.org. Administrated through Netscape Navigator 3.0, the website begins with the homepage entitled "Serving the Pioneer Valley of Western Massachusetts". The three search options offered on the homepage are: Life in the Valley, PVPC Services, and Site Selector. Directly below this is a live map of the Pioneer Valley Region, featuring the 43 towns and cities compromising the area and the major transportation routes. The internet browser can click on any town within the map and quickly get other menus, amusements and attraction information located within each town.

Under the search option entitled PVPC Services, information about the transportation planning services conducted at the commission is given. The transportation activities conducted at PVPC focus on highway corridor planning, traffic counting, and transportation management and studies. Some of the recent projects completed by the Transportation Department include the:

- Boston Road Corridor Study;
- Local Technical Assistance Projects;
- Non-Motorized Plan for the Pioneer Valley;
- Pavement Management Studies;
- Traffic Counts;
- Transportation Improvement Program;
- Unified Work Program; and,
- Upcoming meetings and events.

Lastly, the PVPC Services site gives general information about the Commission along with recent publications put out by the Data, Transportation, and the Community Development departments. The recent copy of the PVPC newsletter is also included under this option.

Executive Summary-of the Transportation Demand Forecasting Model

The Intermodal Surface Transportation Efficiency Act of 1991 has established specific requirements that must be satisfied when planning for transportation projects. These include sixteen factors that MPOs must consider when developing or implementing transportation plans or programs and five additional requirements for the preparation of long-range transportation plans. For long-range transportation planning, ISTEA requires that all areas having populations greater than 200,000 conduct a forecast of near and future conditions using a systematic demand based process. Travel demand forecasting is the process used to identify future year deficiencies based on the demands associated with forecasted socioeconomic factors such as employment, population and housing. In the Pioneer Valley Region, Quick Response System II (QRS II) for Windows, Version 3.6 was the travel demand program used for forecasting near and future conditions. The Pioneer Valley Planning Commission is currently in the process of switching over to a more powerful program called TRIPS.

Travel demand models are developed using detailed computer programs called simulation models. These models are coded to simulate existing travel patterns, existing conditions and to forecast future transportation demands, by relating the socioeconomic characteristics of an area to the travel demand. Future travel demand is forecasted by using projected socio-economic data for future years as input for the model.

There are four basic steps in the travel demand forecasting process: trip generation, trip distribution, modal choice and trip assignment. There is also a preliminary step, network and zone development and a final step, the forecast of socioeconomic conditions. The four steps are repeated for each future year condition.

For the RTP, projected travel demands for future years were assigned to the existing transportation network using the model. The resulting traffic distribution was then analyzed to determine the traffic flow and level of service on different segments of the network. Alternative transportation improvements were drawn up and tested using the model to eliminate current and future congestion and deficiencies in the transportation infrastructure. In addition to traffic projection issues such as environmental assessments, reduction in vehicle miles of travel were also considered in the process.

Executive Summary Non-Motorized Plan 1990's

The Non-Motorized Plan examines the necessity and importance of adding bicycling and walking to the list of transportation choices for all residents of the Pioneer Valley Region. It is the vision of this plan to establish the Pioneer Valley region as an area that is both safe and convenient for pedestrians and cyclists to travel to any destination through an expanding network of bikeways, sidewalks, and accommodating roadways.

Long term development strategies such as changing roadway widths, adding or improving sidewalks, or planning for future bicycle and pedestrian circulation routes will be critical in the effort to expand realistic transportation options within the Pioneer Valley region. Some recommendations suggested within this plan include building a coordinated, comprehensive network of on-street and off-street pedestrian and bicycle facilities, and integrating bicycle and pedestrian needs into both the transportation planning process and highway design-process.

In addition, the plan recommends that bicycle and pedestrian needs in the management and maintenance of our highways, as well as the development process for commercial, residential, and industrial developments. Other recommendations include providing educational opportunities for children and adults to develop skills that reduce the risk of injury while encouraging lifelong bicycling and working habits.

Executive Summary of the Pioneer Valley Region Congestion Management System

The Pioneer Valley Regional Congestion Management System (CMS) is an ongoing transportation planning activity directed at maximizing the mobility of people and goods. The CMS accomplishes this objective through a variety of tasks which identify existing and projected locations with traffic congestion and develop strategies to alleviate and better manage traffic operations in these problem areas. Congested locations are typically characterized by excessive travel delay, large vehicle queues and traffic bottlenecks causing system performance and proposed strategies to aid in project and strategy implementation. Products of the CMS are projects and strategies that increase the mobility of people and goods through enhancements to the transportation infrastructure and changes to users travel behavior. The CMS serves as a guide and technical support for local, regional, and state officials in making decisions related to investments in congestion relief projects and programs in a specific area.

The Pioneer Valley CMS was developed in accordance with the CMS Work Plan for the Commonwealth of Massachusetts and various statewide CMS Technical Team memorandums and encompasses the entire regional federal aid transportation system. Implementation and operation is accomplished through working with the statewide CMS technical team, the BTP&D, the Pioneer Valley Transit Authority, Massachusetts Highway Department, other pertinent entities and the general public. The CMS found 37 locations of which 24 have been verified with existing congestion problems. These locations were identified using the regional travel demand forecasting model and public participation through the Pioneer Valley Joint Transportation Committee. Travel time data is collected on all CMS facilities for congestion verification analysis and monitoring. All locations are monitored to assess the impacts of existing and planned improvement projects. Improvement projects and strategies are developed in conjunction with the impacted community(s), highway department and appropriate agencies. A number of potential strategies will be considered in formulating CMS strategies for congestion relief. These include but are not limited to: transportation demand management (TDM), high occupancy vehicle (HOV), transit congestion pricing, growth management, transportation system management (TSM), access management, incident management, intelligent transportation systems and capital intensive improvements. Suggested strategies and improvement projects resulting from the CMS will be incorporated into the Regional Transportation Plan and the Transportation Improvement Program.

Executive Summary-The Public Participation Process in Transportation Planning

For the transportation planning process to be successful within the Pioneer Valley region, broad public involvement is critical. Incorporating the ideas and interests of citizens requires a new approach to developing transportation plans. Citizens must be involved early on and continue participating throughout the process.

The Pioneer Valley Metropolitan Planning Organization (MPO) incorporates a Public Participation Plan (PPP) into its transportation planning process, which continues to evolve and expand as new methods for encouraging citizen participation are developed. There are a number of public participation committees that are either established or are routinely set up for various transportation projects. The PPP outlines all efforts in the region to encourage a participatory transportation planning process.

The Pioneer Valley Joint Transportation Committee (JTC) is the advisory group for the region on all transportation issue. The JTC was formed to represent both public and private interests in the region. It consists of individuals from local, regional and state government, private transportation organizations and individuals who provide transportation facilities, services or planning for the Pioneer Valley region. The JTC is responsible for making recommendations to the Metropolitan Planning Organization (MPO) or other entities involved in transportation planning for the region.

Aside from the formal committees, PVPC aggressively seeks input from the general public. Public meetings are held at numerous locations around the region. Targeted mailings, faxes, and phone calls are used to urge the participation of business leaders, elected officials, and other concerned stakeholders of the transportation infrastructure.

Pioneer Valley Region Pavement Management System Summary

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) establishes regulations for the states to develop, establish, and implement a system for managing highway pavement of federal-aid highways. These regulations are designed to enhance efficiency and safety while preserving the nation's infrastructure. This effort is being accomplished in cooperation with regional and local planning agencies statewide. The Pioneer Valley Planning Commission (PVPC) is undertaking the development of a system for managing highway pavement of all federal-aid highways in the Pioneer Valley region. The federal-aid highway system consists of any roadway that is not functionally classified as local or rural minor collector. Used as a planning tool, the pavement management system offers the organization and data collection that will allow transportation officials to utilize limited funds more efficiently.

A Pavement Management System (PMS) is a systematic process that collects and analyzes roadway pavement information for use in selecting cost-effective strategies for providing and maintaining pavements in a serviceable condition. ISTEA requires the PMS to be developed in cooperation with the Metropolitan Planning Organization (MPO) and other agencies receiving federal highway or transit funds. The PVPC's regional PMS involves a comprehensive process for establishing the network inventory and project histories, collecting and storing the pavement distress data, analyzing the data, identifying the network maintenance activities and needs and integrating the PMS information in the metropolitan and statewide planning processes. The roadway network covered by the regional PMS includes all urban and rural Federal-Aid highways of the 43 cities and towns in the region. The region consists on 1,400 miles of federal-aid eligible roadways 217 miles of which are included in the NHS and the remaining number of miles are part of the STP. Approximately 70% of the region's federal-aid eligible roadways (960 miles) have been surveyed by PVPC staff. A Pavement Condition Index (PCI) was generated for each inventoried roadway segment in the region using the pavement distress data collected by the PVPC staff. Deducted values assigned to each type of distress based on severity and extent were applied to generate the PCI. PCI is measured from 0 to 100, with 100 being an excellent condition and zero being very poor and impassable condition. The surveyed roadway segments are broken down as follows: 32% of the roadways have a PCI greater than 85 (good to excellent), 33% have a PCI between 65 and 85 (fair), and 35% have a PCI less than 65 (poor).

Appendix B
Congestion Management System



PIONEER VALLEY REGION CONGESTION MANAGEMENT SYSTEM

Moving Recommended CMS Strategies to the Next Step

This document was prepared under contract with the Executive Office of Transportation and Construction,
with the cooperation of the Federal highway Administration and the Federal Transit Administration.



Pioneer Valley Region
Congestion Management System

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Introduction

This is the latest version of the report Moving Recommended CMS Strategies to the Next Step for the Pioneer Valley Region. This version builds upon the original draft version dated June 26, 1996 which was in response to the memorandum dated March 22, 1996, to Transportation Program Managers and Congestion Management System (CMS) Technical Team Members. New information contained in this version includes recent feedback resulting from ongoing public participation through the Pioneer Valley Joint Transportation Committee. As requested at the April 17, 1996, CMS Technical Team meeting, a status of the CMS activities in the Pioneer Valley Region and the next course of action in developing and moving forward recommended strategies toward implementation is also provided. This includes: the status of the data collection, congestion verification analysis, location specific summaries, summary of needs, sequence of strategy development and prioritization, project initiation and implementation, and regionwide needs and improvement strategies. Findings of this report will be used for the source of congestion relief information for the update to the Regional Transportation Plan scheduled for completion in March of 1997.

Data Collection

The initial needs assessment resulted in the identification of 49 locations within the Pioneer Valley Region with potential traffic congestion problems. To verify that these locations are congested and to determine their severity, travel time information is collected. This is consistent with recommended data collection procedures discussed at previous CMS Technical Team meetings. Detail outlining this process is described in the November 1995 activity report. Updated status of the data collection process is presented in Table 1 for all CMS facilities. This includes the number of travel time runs as of June 1996 by location for both the AM and PM periods. Additional information such as posted speed limits and observed travel speed is also collected for use in model calibration. To assist in the travel time data collection procedures the Pioneer Valley Planning Commission (PVPC) is experimenting with a Global Positioning System (GPS). The GPS will be used for collecting travel time and location information electronically instead of current manual methods. The information collected will be brought into the Geographic Information System for visual presentation and analysis.

Congestion Verification Analysis

As previously mentioned the initial needs assessment identified all locations with potential congestion problems. Travel time runs were conducted at all these locations for two hour periods in both the AM and PM. The data collection procedure is explained in the November 1995 status report. Each location was extended and segmented by various landmarks where travel times were recorded. This information was then put into a travel time database for analysis to verify congestion problems.

There were two measures used to verify congestion are delay and the congestion ratio. Delay is defined as the difference between the second worst and second best travel time for that section in seconds per mile.

$$\text{Delay} = \frac{(\text{Second Worst Travel Time})}{(\text{Length of Roadway})} - \frac{(\text{Second Best Travel Time})}{(\text{Length of Roadway})}$$

The congestion ratio is defined as the second worst travel time divided by the second best travel time for that section.

$$\text{Congestion Ratio} = \frac{(\text{Second Worst Travel Time})}{(\text{Second Best Travel Time})}$$

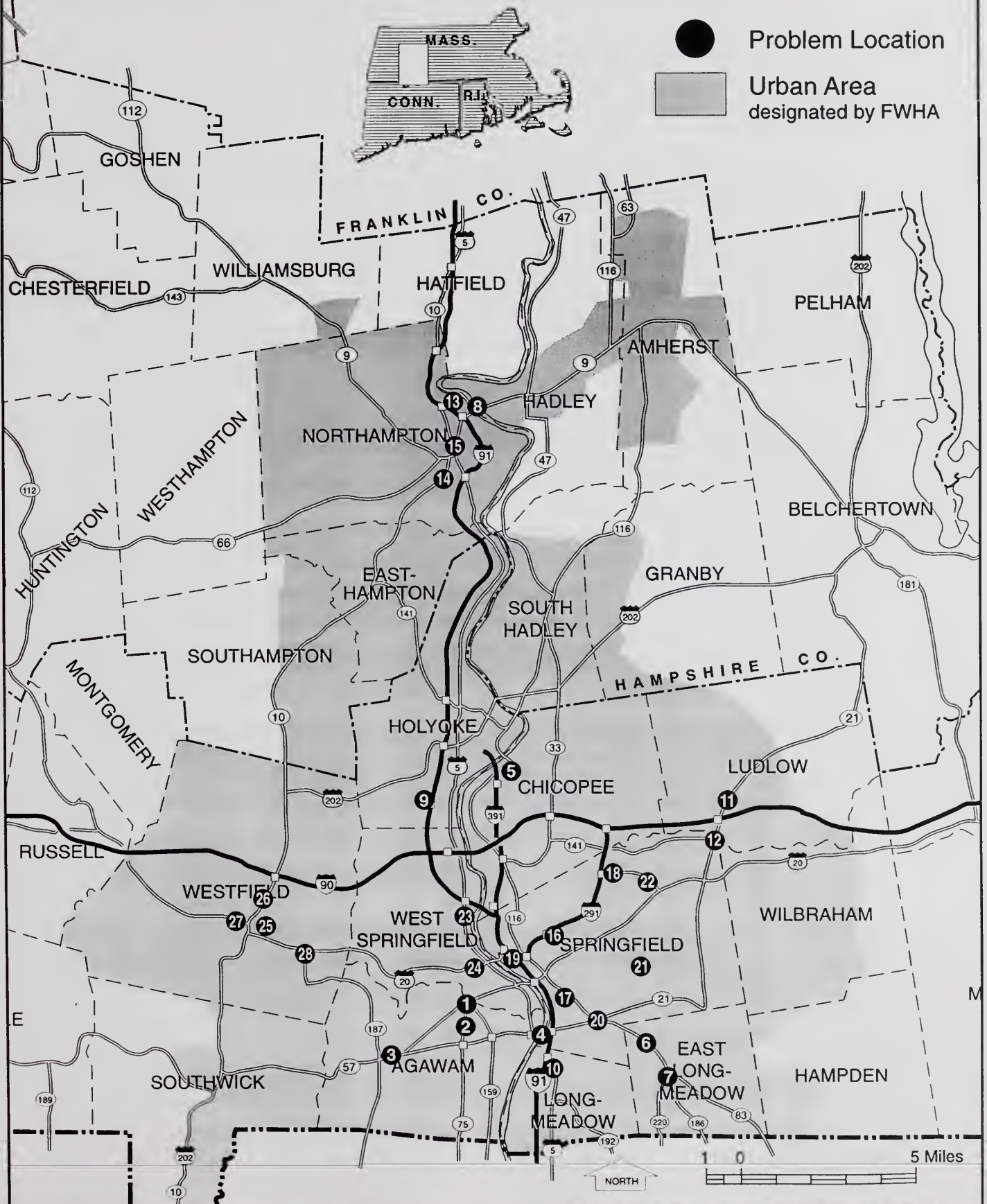
The best and worst travel times were not used since these could be extreme cases and may not reflect typical travel conditions. There were two analysis conducted, one by corridor and the other by segment. The analysis by corridor consisted comparing a series of combined segments which made up the problem location. Analysis by segment consisted of comparing each segment of each study corridor. Results from the corridor analysis verified the locations experiencing traffic congestion. Results from the segment analysis also verified congestion problems that resulted in the corridor analysis and isolated the problems in more detail. The top locations with the largest delay and congestion ratio by segment and corridor were compiled and summarized. A final list of locations with verified congestion problems was then made and is presented in Table 2.

Table 2
Pioneer Valley Region
Congestion Management System
Problem Locations Identified

LABEL	COMMUNITY	LOCATION	LIMITS
1	Agawam	Route 147 and Route 159	Rowley Street to Federal Street
2	Agawam	Route 75	Mill Street to Route 159 and Route 147
3	Agawam	Route 57	Poplar Street to Route 187
4	Agawam/Springfield	Route 5 (South End Bridge)	South End Bridge + Access Ramps
5	Chicopee	Prospect Street	Route 116 to Buckley Boulevard
6	East Longmeadow	Route 83	Harkness Avenue to Dearborn Street
7	East Longmeadow	Downtown Rotary	Seven Leg Rotary
8	Hadley/Northampton	Rte. 9 (Calvin Coolidge Bridge)	West Street to Damon Road
9	Holyoke	L. Westfield Rd & Homestead Ave.	Holy Family Road to Upland Road
10	Longmeadow	Route 5	Forest Park Entrance to Forest Glen Road
11	Ludlow	Center Street	Cherry Street to Mass Turnpike Entrance
12	Ludlow/Springfield	Route 21	East Street to North Branch Parkway
13	Northampton	Damon Road and Bridge Road	Industrial Drive to Jackson Street
14	Northampton	Route 10	Old South Street to Main Street
15	Northampton	Route 9	Hawley St./Market St. to Prospect St.
16	Springfield	Magazine St. and Armory St.	Worthington to Armory St./I-291 Rotary
17	Springfield	Main Street and Locust Street	State Street to Belmont Avenue
18	Springfield	Route 20A (Page Boulevard)	East Street to Oakdale Street
19	Springfield	Route 20	Rte. 20/Plainfield St/Avacado St. Intersection
20	Springfield	Sumner Avenue	Forest Park Avenue to White Street
21	Springfield	Roosevelt Avenue	Island Pond Road to Wilbraham Road
22	Springfield	Route 20A (Page Boulevard)	Pasco Road to Berkshire Avenue
23	West Springfield	Route 5	Ashley Avenue to Morgan Street
24	West Springfield	Route 20	Kings Highway to Route 20
25	Westfield	Mechanic St. and Meadow St.	Route 20 to Route 10/202
26	Westfield	Route 10/202	Main Street to Sunset Drive
27	Westfield	Washington St. and Franklin St.	Court Street to Elm Street
28	Westfield	Route 20	E. Mountain Rd. to Westfield Shops

Pioneer Valley Region

Congestion Management System Problem Locations Identified



Location Specific Summaries

This section describes existing information known about each of the verified problem locations including initial strategies and the next step to investigate improvement alternatives. Each location summary is divided into eight sections described below.

Community - This is the community or communities the congestion problem is located in.

Problem Location - This is the area (Roadway(s), Park-n-Ride Lot, Rotary, Bridge, etc.) and limits of the congestion problem identified.

Problem Description - This is a summary of the type and potential causes of the traffic congestion experienced during the data collection process. Included are basic geometrics of the location and any related information affecting the study area such as land uses and major highways.

Current Activities - These are active community projects or projects programmed in the most recent Pioneer Valley Transportation Improvement Program that are part of or near the problem location. Also included is any construction activity part of or near the problem location that is currently in progress. Please note that projects associated with these locations do not necessarily alleviate the congestion problem. Many projects are in conceptual or initial stages of design and may be open to changes to incorporate congestion relief strategies.

Potential Improvement Alternatives/Strategies - This section presents conceptual congestion relief strategies developed by the PVPC staff to be pursued which are based on experience during the data collection. Please note these strategies are preliminary and will change once discussed with the appropriate community and/or highway department district office.

PVPC Recommendation - PVPC staff recommendation to either study the location in further detail or monitor the effect of a project to be implemented effecting the location.

Jurisdiction - This section outlines the jurisdictional responsibility (state, local or joint) for the problem location and any facilities directly impacting the study area.

Next Course of Action - This is the next activity currently planned to move towards project initiation or to monitor impacts of an existing construction project.

Party Responsible For Next Action - This is the party responsible for initiating the next course of action.

Priority - This is the initial ranking of the problem location. This is based on the severity of the traffic congestion experienced. Each location has a rank of either low, medium or high priority.

COMMUNITY - Agawam**PROBLEM LOCATION - Route 147 (Springfield Street) and Route 159 (Main Street) from Rowley Street to Federal Street.**

PROBLEM DESCRIPTION - There are two problem locations identified along this corridor. One area is the two signalized intersections of Route 147 with North Street and Maple Street which are approximately .1 miles apart. Route 147 serves as a connector road to Route 57 (Springfield Street) for travelers from the Springfield and West Springfield area heading toward the Feeding Hills center in Agawam and the community of Southwick. North Street serves as a connector to Route 187 for people traveling to and from western portions of Agawam and the city of Westfield. Traffic converges at this location creating large traffic queues along the eastbound approaches of North Street and Route 147. The second problem location is the roadway between the signalized intersections of the Route 147 bridge (BR# A-5-002), Route 147, Route 159 and Route 75 (Suffield Street) and the intersection of Route 147, Walnut Street at the Walnut Street Extension. These intersections are in close proximity with retail land uses along both sides of Route 147. Vehicles entering and exiting these retail areas obstruct traffic flow and cause traffic to queue at both of these intersections. The worst approaches to the intersection of Route 147 and Route 75 at Route 159 are eastbound from Route 147 (Agawam) and northbound from the Route 147 bridge. The Route 147 bridge northbound approach has a shared through/left turn approach and a channelized right turn lane. Left turning vehicles onto Route 159 are opposed by through traffic from Route 75 causing vehicles to queue over the Route 147 bridge into West Springfield. The Route 147 eastbound approach to this intersection has an exclusive left turn lane and shared through/right turn lane. The left turn movement onto the Route 147 bridge is a protected movement for only a portion of the signal phase and otherwise is opposed by traffic from Route 159. This causes vehicles to queue back into the Route 147 intersection with Walnut Street and the Walnut Street extension. The Route 75 southbound and Route 159 westbound approaches to Route 147 are also problems but not as severe.

CURRENT ACTIVITIES - Reconstruction and widening of Route 75 in Agawam is programmed in the Pioneer Valley Transportation Improvement Program. The reconstruction of Route 147 in West Springfield is programmed in the Pioneer Valley Transportation Improvement Program.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Signal optimization and coordination at the intersections of Route 147 and Route 159 at Route 75 (Agawam), Route 147 at Walnut Street (Agawam) and Route 147 at River Street (West Springfield). This will improve and control traffic flow across the Route 147 bridge and through the section of Route 147 between Walnut Street and the Route 147 bridge. Widen Route 147 between Route 75 and Walnut Street to increase the storage capacity for left turning vehicles. Improving the signal timing and coordination at the Route 147 at Maple Street and Route 147 at North Street intersections could improve the movement of vehicles through these two intersections.. Possibly redesign the two intersections of North Street with Route 147 and the intersection of Route 147 at Maple Street into one intersection.

PVPC RECOMMENDATION - Requires further study.

JURISDICTION - The community of Agawam has jurisdictional responsibility for Route 147 (except for BR# A-5-002), Route 75, Walnut Street, Walnut Street Extension, North Street and Maple Street in the vicinity of the study area. The state has jurisdiction of the Route 147 bridge and Route 159 in the vicinity of the study area.

NEXT COURSE OF ACTION - Monitor the impacts of the existing projects in the Pioneer Valley Transportation Improvement Program.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Agawam

PROBLEM LOCATION - Route 75 (Suffield Street) from Mill Street to the Route 159 (Main Street), Route 147 (Springfield Street) and the Route 75 intersection.

PROBLEM DESCRIPTION - The main problem location along this roadway segment is the four way intersection of Route 75, Route 159, the Route 147 bridge and Route 147 (Springfield Street). The north-bound Route 75 approach to Route 147 is a shared left, through and right turn lane approach attracting vehicles from southern Agawam, Route 57 and northern Connecticut. The problem associated with this approach is left turn movements onto Route 147 westbound which are opposed by through traffic from the Route 147 bridge. This causes excessive delays for through and right turning vehicles on Route 75. The intersection of Route 75 with Cooper Street is also a problem due to insufficient shoulder width for turning vehicles.

CURRENT ACTIVITIES - Reconstruction and widening of Route 75 is programmed in the Pioneer Valley Transportation Improvement Program. The community of Agawam has plans to improve the intersection of Route 75 (Suffield Street) with South Street and Shoemaker Lane using Chapter 90 funds.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Roadway widening of Route 75 at its approaches with Route 159 and Cooper Street to accommodate turning vehicles. See improvement alternatives for Route 147 and Route 159 from Rowley Street to Federal Street.

PVPC RECOMMENDATION - Requires further study. The intersection of Route 75, Route 159, the Route 147 bridge and Route 147 (Springfield Street) could be analyzed as part of PVPC's local technical assistance program.

JURISDICTION - The community of Agawam has jurisdictional responsibility for Route 75. The state of Massachusetts has jurisdictional responsibility for the Route 147 bridge and Route 159.

NEXT COURSE OF ACTION - Meeting with the community of Agawam and the Massachusetts Highway Department to discuss potential improvement alternatives for the area identified above.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Agawam**PROBLEM LOCATION - Route 57 (Springfield Street) from Poplar Street to Route 187 (North and South Westfield Streets)**

PROBLEM DESCRIPTION - The problem identified along this corridor is traffic queues during the morning and afternoon peak hours at the four way signalized intersection of Route 57 and Route 187. Route 187 is on a north/south alignment with a two lane approach in each direction consisting of an exclusive left turn lane and shared through/right turn lane. Route 57 is on a east/west alignment with a two lane approach in each direction consisting of an exclusive left turn lane and shared through/right turn lane. The southern portion of Route 187 (South Westfield Street) connects to the relocated Route 57 and northern Connecticut. The northern portion of Route 187 (North Westfield Street) connects to Route 20 in the city of Westfield. Route 57 provides a link between communities west of Agawam to the Springfield area. Therefore a large volume of traffic converges at this intersection during the morning and afternoon commute period. The Agawam Junior High School and retail development just east of this intersection further contribute to the congestion along Route 57 with a signalized intersection less than .2 miles east of Route 187 at the Stop and Shop supermarket entrance.

CURRENT ACTIVITIES - Reconstruction of Route 187 from the Westfield City Line to the relocated Route 57 and Feeding Hills center (Route 187 at Route 57 intersection) is programmed in the Pioneer Valley Transportation Improvement Program. The next phase of the Route 57 project including construction from Route 187 (Agawam) to Southwick is also programmed in the Pioneer Valley Transportation Improvement Program.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Reconfigure the Route 57 at Route 187 intersection to include new approach lane assignments on the Route 57 eastbound approach. Currently this approach has an exclusive left turn lane and a shared through/right turn lane. Adding an exclusive right turn lane to this approach could allow better canalization of vehicles traveling east from Southwick to access the new Route 57 just south of this intersection. This will require land taking at this intersection. Signal optimization and coordination with the traffic signal at the Stop and Shop supermarket entrance with the Route 57 and Route 187 intersection could improve traffic flow through the western portion of this corridor.

PVPC RECOMMENDATION - Monitor the impacts of the new Route 57 project.

JURISDICTION - The community of Agawam has jurisdictional responsibility for this portion of Route 57 and Route 187.

NEXT COURSE OF ACTION - Meeting with the community of Agawam to discuss the possible improvements for the area identified above.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITIES - Agawam and Springfield**PROBLEM LOCATION - South End Bridge including Entrance and Exit Ramps**

PROBLEM DESCRIPTION - The South End Bridge (BR# A-5-001) connects the community of Agawam with southern Springfield providing two travel lanes in each direction. The westbound direction in Agawam provides access to and from Route 57, eastern Agawam and Route 5 north. The eastbound direction in Springfield provides access to and from Interstate 91, southern Springfield and Route 5 south. The congestion typically occurs during the PM commute period in the westbound direction. This is due to a large volume of traffic accessing Route 57 for locations west such as Agawam and Southwick. Vehicles typically extend along the Route 57 off ramp, over the South End bridge onto exit ramps from Interstate 91 and downtown Springfield. Therefore one travel lane is continually blocked along the bridge in the westbound direction and traffic bottlenecks at the westbound entrance to the bridge due to merging vehicles. The westbound off ramp to Route 57 leads into a rotary that provides access to and from Route 5 and Route 57 which also becomes congested due to the large influx of vehicles.

CURRENT ACTIVITIES - Reconstruction of the South End bridge is identified in the Pioneer Valley Transportation Improvement Program.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Redesign the existing westbound off ramp from the South End Bridge to extend directly onto Route 57 westbound. This will be an exclusive exit off the South End Bridge for Route 57 westbound only. Realign the Route 5 southbound off ramp to merge with this new ramp at the entrance to Route 57. This will provide access to Route 57 westbound from Route 5 southbound and Route 5 northbound only. Investigate the benefits of signaling some approaches to the rotary to create artificial gaps for South End Bridge traffic.

PVPC RECOMMENDATION - Requires further study.

JURISDICTION - The state has jurisdictional responsibility for the South End bridge and all access ramps.

NEXT COURSE OF ACTION - Continue to monitor this area as part of the congestion management system. Also continue dialogue between the Massachusetts Highway Department, the city of Springfield and town of Agawam to discuss possible improvement alternatives that could be tied into the reconstruction of this bridge.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Chicopee

PROBLEM LOCATION - Prospect Street from Route 116 (Chicopee Street) to Buckley Boulevard.

PROBLEM DESCRIPTION - This is a short roadway segment approximately .1 miles long on an incline connected by two four way intersections with traffic control signals. This area is in close proximity to the Route 116 Willamansett Bridge connecting the cities of Chicopee and Holyoke. The intersection of Prospect Street with Buckley Boulevard and Yelle Street is the most severe of the two. The Prospect Street eastbound approach provides two lanes and the westbound one lane. The southbound approach of Buckley Boulevard has a shared through/left turn lane and a channelized right turn lane separated by a traffic island. The northbound approach of Yelle Street provides one travel lane for left, through and right turn movements. Yelle Street attracts a large amount of traffic from Interstate 91, Interstate 391 and Route 33 east of this location. Left turn movements from Yelle Street onto Prospect are opposed by right turns from Buckley Boulevard making it difficult for vehicles to navigate through this intersection. Most movements from the Prospect Street eastbound approach use the through movement very little and either make left turns onto Buckley Boulevard or right turns onto Yelle Street. The intersection of Chicopee Street, Prospect Street and Erline Street is less severe of a problem. The Prospect Street westbound approach provides two travel lanes and the eastbound approach of Erline Street provides a one lane approach. The Prospect Street westbound approach can back up into the Prospect Street, Buckley Boulevard and Yelle Street intersection. The Chicopee Street southbound approach has three travel lanes one exclusively for left turning vehicles which is channelized and separated by a small traffic island. The Chicopee Street northbound approach provides two travel lanes separated by a traffic island.

CURRENT ACTIVITIES - Reconstruction of Buckley Boulevard and a portion of Prospect Street from Yelle Street to Memorial Drive (Route 33) is programmed in the Pioneer Valley Transportation Improvement Program. The reconstruction of Chicopee Street will include improvements to the intersections of Chicopee Street at Prospect Street and Prospect Street at Yelle Street and Buckley Boulevard.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Improve the existing clearance at the railroad overpass at the intersection of Prospect Street with Chicopee Street. This improvement was recommended as a long range alternative as a result of discussions with the city of Chicopee.

PVPC RECOMMENDATION - Massachusetts Highway Department to move forward TIP projects identified above.

JURISDICTION - The community of Chicopee has jurisdictional responsibility for Prospect Street, Route 116 and Yelle Street within the study area.

NEXT COURSE OF ACTION - Monitor impacts of the proposed improvements.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - East Longmeadow**PROBLEM LOCATION - Route 83 from Harkness Avenue to Dearborn Street.**

PROBLEM DESCRIPTION - Route 83 provides access between downtown Springfield to East Longmeadow and northern Connecticut. This section of Route 83 is approximately .5 miles in length and has a series of four traffic signals, two of which provide access to retail shopping plazas. The close proximity of these intersections and lack of channelization at intersection approaches create confusion for vehicles traveling through this section of Route 83 and into the shopping plazas. It is very easy for a person to be delayed in a traffic queue at one of these intersections due to left turning vehicles opposed by through movements.

CURRENT ACTIVITIES - Removal of the railroad bridge at Harkness Avenue and coordination of traffic signals from Dearborn Street to Harkness Avenue. The PVPC is currently assisting the community of East Longmeadow in studying this location. The town of East Longmeadow also has plans to install a new lane marking plan to eliminate confusion in this area. The reconstruction of both Elm Street and Westwood Street are currently programmed in the Pioneer Valley Transportation Improvement Program. Once completed, these two projects may siphon traffic off of Route 83 and reduce congestion in this area.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Reconfigure the approach lanes to each intersection and install sufficient pavement markings and signs to warn drivers of the upcoming lane configurations.

PVPC RECOMMENDATION - It is recommended that the town of East Longmeadow advance plans to improve the existing pavement markings in this area based on the information provided by the PVPC as part of the Local Technical Assistance program. In addition it is also recommend that this area be included in a traffic study of the Route 83 rotary currently earmarked for funding as part of the Transportation Bond Bill.

JURISDICTION - The town of East Longmeadow has jurisdictional responsibility for Route 83 within the study area.

NEXT COURSE OF ACTION - Continue to monitor this area as part of the Congestion Management System. Work with the town of East Longmeadow in the development of a Scope of Work and Request for Proposals for a transportation study of the Route 83 rotary. The town of East Longmeadow has requested that the PVPC manage the contract for this study.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC/Town of East Longmeadow

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - East Longmeadow

PROBLEM LOCATION - *East Longmeadow rotary at Route 186 (Prospect Street), Route 83 (Somers Road), Route 83 (North Main Street), Route 220 (Shaker Road), Pleasant Street, Maple Street and Elm Street.*

PROBLEM DESCRIPTION - This is a seven leg rotary in the downtown area of East Longmeadow. Route 83 (North Main Street) provides the primary connection between the center of East Longmeadow to downtown Springfield. Maple Street provides a connection to the town of Longmeadow and Routes 220, 186 and 83 (Somers Street) connect to portions of northern Connecticut. There is significant traffic backups along many of these streets feeding the rotary especially in the east and west directions. Based on visual observations the Pleasant Street and Maple Street approaches were the most severe. Pedestrian crosswalks at the approaches and an unusual geometry creates stop and go traffic making it confusing to navigate through this rotary especially in determining who has the right of way. Therefore, vehicles queue along these side streets and cause congestion problems along these roads in addition to the rotary.

CURRENT ACTIVITIES - A transportation study of this area is currently earmarked for funding as part of the Transportation Bond Bill.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The town of East Longmeadow would like to explore the alternative of creating a bypass roadway for trucks on either Pease Road or Chestnut Street. An advisory committee of local officials, businesses, and residents should be formed to assist in the development of alternatives for study as part of the proposed transportation study for this area.

PVPC RECOMMENDATION - A detailed origin and destination survey should be conducted as part of the transportation study. In addition the study should consider both geometric improvements to the existing rotary and the use of alternative strategies to alleviate congestion in this area. The preferred alternative of this study should be advanced through the Pioneer Valley Transportation Improvement Program.

JURISDICTION - The community of East Longmeadow has jurisdictional responsibility for the following roadways comprising the rotary: Route 186 (Prospect Street); Route 83 (Somers Road); Route 83 (North Main Street); Route 220 (Shaker Road); Pleasant Street; Maple Street and Route 83 (Elm Street).

NEXT COURSE OF ACTION - Continue to monitor this area as part of the Congestion Management System. Work with the town of East Longmeadow in the development of a Scope of Work and Request for Proposals for the transportation study of the Route 83 rotary. The town of East Longmeadow has requested that the PVPC manage the contract for this study.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC/Town of East Longmeadow.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Hadley and Northampton

PROBLEM LOCATION -Route 9 (Russell Road) from Bay Road to Damon Road

PROBLEM DESCRIPTION - Severe congestion occurs at two locations along this segment of Route 9 impacting the flow of traffic on the Calvin Coolidge Bridge. Route 9 provides two travel lanes in the eastbound direction up to its intersection with Bay Road where one exclusive through movement lane and one exclusive right turn lane are provided. East of this intersection Route 9 narrows to one travel lane resulting in long queues for westbound traffic. On the this approach of Route 9 one shared left turn/through movement lane and one exclusive through movement lane are provided. West of the intersection the roadway tapers back to one travel lane prior to the Calvin Coolidge Bridge resulting in long delays.

The second location of severe congestion is the intersection of Route 9 and Damon Road in Northampton. The major problem is the eastbound approach of Route 9 which has one shared left turn/through lane and one exclusive through movement lane. Traffic queues in the westbound direction from the I-91 southbound entrance to this intersection impact vehicles entering and exiting Damon Road. Traffic queues east of this intersection extend over the Calvin Coolidge Bridge into Hadley, especially during the PM and weekend peak periods. Congestion in the westbound direction on the Calvin Coolidge bridge can be a much more serious problem as traffic attempts to cross the bridge on a single lane of travel. Congestion also occurs in the vicinity of the I-91 southbound on ramp as vehicles waiting to turn left from Route 9 queue into the through traffic lane adversely affecting westbound traffic.

CURRENT ACTIVITIES - The widening of Route 9 in Hadley is programmed in the Pioneer Valley Transportation Improvement Program. This project includes widening Route 9 to four travel lanes from West Street to the Calvin Coolidge Bridge. The rehabilitation of the Calvin Coolidge Bridge (BR# H-01-012) is also programmed in the Pioneer Valley Transportation Improvement Program (TIP) and consists of widening the bridge from three to four travel lanes. The intersection of Route 9 with Damon Road has been recently reconfigured.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Any alternatives proposed for this area should conform to the recommendations as set forth by the Route 9 Corridor Study completed by the PVPC in 1992. All proposed improvement alternatives should also be discussed with the Route 9 Corridor Advisory Committee which meets on a regular basis.

As growth continues to occur in this area, additional long range strategies may be required. It is recommended that the effects of the current activities in this area be monitored as part of the Congestion Management System. Should this monitoring program indicate that congestion has returned to the area the Route 9 Corridor Advisory Committee will be consulted to discuss the potential for a Major Investment Study in this area.

PVPC RECOMMENDATION - The Massachusetts Highway Department should continue to move forward with the TIP projects as identified above.

JURISDICTION - The state of Massachusetts has jurisdictional responsibility over this portion of Route 9 and the Calvin Coolidge Bridge.

NEXT COURSE OF ACTION - Monitor the effects of the Route 9 widening and Calvin Coolidge Bridge projects. If growth continues to occur and congestion returns to this area, additional long range solutions to address congestion should be explored as part of a future Major Investment Study.

PARTY RESPONSIBLE FOR NEXT STEP - Massachusetts Highway Department and PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Holyoke

PROBLEM LOCATION - *Homestead Avenue and Lower Westfield Road from Upland Road to Whiting Farms Road.*

PROBLEM DESCRIPTION - The traffic congestion in this area is caused by two four way signalized intersections approximately .4 miles apart in addition to the Interstate 91 interchange #15 between the two. One location is the intersection of Lower Westfield Road, Whitney Avenue and Homestead Avenue. The Homestead Avenue southbound approach has one travel lane that widens at the approach providing an exclusive left turn lane and shared through/right turn lane. The problem with this approach is that left turning vehicles are opposed by through and right turning vehicles from Whitney Avenue for a portion of the signal phase. This causes vehicles to overfill the left turn storage lane and block through moving vehicles. The second location is the four way intersection of Lower Westfield Road, Whiting Farms Road and Holyoke Street. Holyoke Street is a primary access road to the Holyoke Mall for vehicles from Interstate 91 and north eastern portions of Holyoke. High volumes of traffic attracted to this location creates congestion especially along Lower Westfield Road and Holyoke Street. A traffic signal located at the Interstate 91 southbound off/on ramps also creates delays along Lower Westfield Road due to its close proximity to the other two intersections.

CURRENT ACTIVITIES - Traffic mitigation project for the new Holyoke Crossings retail shopping plaza adjacent to the Holyoke Mall. The city of Holyoke has conceptual design plans to improve the intersection of Homestead Avenue with Lower Westfield Road. Plans for the intersection of Homestead Avenue with Westfield Street are at the 100% design stage and will be constructed with Chapter 90 funds by the city of Holyoke.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Improvements were done in this area as part of the traffic mitigation for the Holyoke Mall Expansion. Data collection was done prior to implementation of these mitigation measures. Therefore, monitoring these recent traffic improvements is recommended at the present time.

PVPC RECOMMENDATION - Monitor the impacts of the mitigation project and proposed projects by the city of Holyoke.

JURISDICTION - The state has jurisdictional responsibility for Lower Westfield Road between the Interstate 91 interchange ramps. The city of Holyoke has jurisdictional responsibility for other roads in the study area.

NEXT COURSE OF ACTION - Monitor the recent improvements implemented as part of the Holyoke Mall expansion project. Assist the city of Holyoke in implementing the conceptual improvements for the intersection of Homestead Avenue, Lower Westfield Road and Whitney Avenue.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Longmeadow**PROBLEM LOCATION - Route 5 from Forest Glen Road to Williams Street.**

PROBLEM DESCRIPTION - The signalized intersections of Route 5 with Forest Glen Road and Western Drive, Route 5 at Converse Street, and Route 5 at Bliss Road all currently experience congestion as a result of the heavy volumes of vehicles turning left from Route 5 southbound. These roadways provide east/west access to the communities of East Longmeadow and Springfield, as well as I-91.

CURRENT ACTIVITIES - The Town of Longmeadow has plans to improve the signal timing and phasings at the intersection of Route 5 with Forest Glen Road and Western Drive. Traffic signals are also planned for the existing unsignalized intersections of Converse Street at Dickinson Street and Converse Street at Dwight Street which may assist in reducing the cut-through traffic along this roadway.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Study the effects of changes to the existing traffic signal timings and phasings in this area. The PVPC completed a Route 5 Corridor Study during the 1980's in this area. This study may require updating to address these issues.

PVPC RECOMMENDATION - Monitor the effects of the proposed improvement projects in this area. Discuss potential changes to the traffic signal phasings and timings along Route 5 with the Town of Longmeadow.

JURISDICTION - The Town of Longmeadow has jurisdiction over Route 5 in its entirety.

NEXT COURSE OF ACTION - Monitor the effects of the proposed improvement projects in this area.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Northampton**PROBLEM LOCATION - Route 10 from Old South Street to Main Street.**

PROBLEM DESCRIPTION - The Route 10 (New South Street) northbound approach to Route 9 (Main Street) is the main problem along this roadway segment. This approach consists of a right turn only lane and a shared through/left turn lane which is where the severe congestion occurs. A large volume of traffic queues at this approach and block vehicles traveling southbound on Route 10 turning east onto Old South Street. Vehicles waiting to make this movement will blocks other vehicles traveling southbound on Route 10.

CURRENT ACTIVITIES - The Massachusetts Highway Department advertised the project to signalize and reconstruct the intersection of Route 10 and Old South Street. The existing unsignalized "Y" shaped intersection will be redesigned into a signalized "T" intersection with a pedestrian crosswalk. Parking will be eliminated in front of the McCormick building to allow for an extra travel lane between Old South Street and Main Street. The PVPC staff is currently investigating signal coordination of this intersection with the intersections of Route 10 at Route 9 and Route 9 at Route 66. The city will have a private consultant analyze the intersection of Route 10 at Earl Street. This will be done to determine potential traffic impacts of the State Hospital Redevelopment Project.

POTENTIAL IMPROVEMENT ALTERNATIVES - Further improvements will determined following the PVPC analysis of this location through the Local Technical Assistance program.

PVPC RECOMMENDATION - Massachusetts Highway Department to move forward TIP project identified above.

JURISDICTION - The city of Northampton has jurisdictional responsibility for Route 10 and Old South Street in the study area.

NEXT COURSE OF ACTION - Monitor the effects of the signalization project scheduled for implementation in the near future. PVPC staff to continue with analysis as part of the Local Technical Assistance program and work with the city to develop other congestion relief strategies in the future.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC, Massachusetts Highway Department and city of Northampton..

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Northampton

PROBLEM LOCATION - *Route 9 from the Hawley Street and Market Street intersection to Prospect Street and the Florence area from Chestnut Street to North Maple Street.*

PROBLEM DESCRIPTION - This is the downtown area in the city of Northampton with heavy pedestrian traffic. There are three major intersecting roadways along this stretch of Route 9 that include Route 10, Route 66 and Route 5. These three intersections are the three most congested locations along this corridor. The large volume of traffic carried by these routes, heavy pedestrian traffic crossing Route 9 and on street parking create a severely congested area with slow movement of vehicles due to stop and go traffic. Traffic in the Florence area slowed between the signalized intersections of Chestnut Street and North Maple Street. This was due to the close proximity of the two signalized intersections, on street parking and pedestrian crossings. This area operated similar to the downtown area but travel delay was much less severe.

CURRENT ACTIVITIES - Route 9 is scheduled to be resurfaced from Bridge Street to Haydenville Road in the Pioneer Valley Transportation Improvement Program. A Park and Ride lot is planned to be developed at Sheldon Field in Northampton along Route 9 just east of the downtown area. This will include bicycle storage facilities and have access to the public transit system. This will encourage the use of transit and bicycles for navigation to or through the downtown area. The city of Northampton has a consultant analyzing the intersection of Route 9 and Route 5. The city is also exploring additional parking for the downtown area.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The Pleasant Street approach to its intersection with Route 9 and King Street currently has a shared through/left turn lane and an exclusive right turn lane. Improvements to this intersection include eliminating the left turn movement from Pleasant Street onto Route 9 and redesigning the approach lanes. Currently this left turn movement is opposed by eastbound traffic from King Street and causes large vehicle queues along Pleasant Street. This improvement will require vehicles accessing Route 9 to use an alternate route to the downtown via Conz Street. There will be improved flow of westbound traffic on Pleasant Street since there will no longer be a conflicting flow of traffic from King Street. The new Pleasant Street approach lanes will include exclusive through and right turning lanes. Reconfigure and retime the traffic signal at the intersection of Route 9 and Route 10. Make State Street one way northbound from Route 9 to Bedford Terrace and State Street one way west to Route 9. Install actuated pedestrian controls at the intersections of Route 9 with Route 10 and Route 9 with Route 66.

PVPC RECOMMENDATION - Requires further study.

JURISDICTION - The city of Northampton has jurisdictional responsibility for Route 9, King Street and Pleasant Street in the study area.

NEXT COURSE OF ACTION - The PVPC will offer its technical services to the city of Northampton to discuss potential improvements and/or review consultant's recommendations.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC and the city of Northampton.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Northampton**PROBLEM LOCATION - Damon Road from Industrial Drive to King Street**

PROBLEM DESCRIPTION - There are two locations of severe traffic congestion along this corridor. One location is the Damon Road, King Street, North King Street and Bridge Road intersection. Large volumes of traffic from downtown Northampton, I-91 and western portions of Northampton converge at this intersection creating large traffic queues and delays in all directions. The second location is the Damon Road southbound approach to Route 9. This approach attracts vehicles traveling to the I-91 southbound access ramps and the community of Hadley via the Calvin Coolidge bridge. The Calvin Coolidge bridge is the only means for motorized vehicle access between communities of Hadley and Northampton and attracts large volumes of traffic. Traffic queues along the southbound direction of Damon Road can extend from the Route 9 approach to the vicinity of the King Street intersection.

CURRENT ACTIVITIES - Reconstruction of Damon Road from Route 9 to King Street is programmed in the Pioneer Valley Transportation improvement Program. A project involving the reconfiguration of the Route 9 at Damon Road intersection is currently underway. Extension of the Norwottuck Rail Trail into downtown Northampton and a Park and Ride lot at Sheldon Field in Northampton are both planned. The design contract for the reconstruction of Damon Road will be advertised in October 1996. There is a project underway to make geometric improvements to the intersection of Industrial Drive and Damon Road. This will involve installing exclusive left and right turning lanes on the Industrial Drive approach to Damon Road to better accommodate large turning vehicles. An at grade crossing of the Norwottuck Rail Trail is planned on Damon Road rather than a bridge under the road for the future trail extension project.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Propose a study to examine expanding Interstate -91 (I-91) interchanges #19 and #20 or creation of a new interchange along Damon Road. Currently both I-91 junctions #19 and #20 are partial interchanges. Access to and from I-91 southbound is provided at interchange 19 and access to and from I-91 northbound is provided at interchange #20. Vehicles along King Street using Damon Road southbound to access I-91 southbound will be drawn north to interchange #20 or a new interchange along Damon Road. This will alleviate congestion along the Damon Road southbound approach to Route 9 by providing another means of accessing I-91 south. Congestion will also be alleviated from Damon Road northbound and North King Street southbound with other points of access to I-91 both north and south. The city and MHD both mentioned that geometric improvements to the Damon Road approach to King Street should be considered. This will involve land takings that include two houses at Damon Road approach to King Street.

PVPC RECOMMENDATION - Requires further study.

JURISDICTION - The state of Massachusetts has jurisdictional responsibility for I-91 and the city of Northampton has jurisdictional responsibility for other roads in the study area.

NEXT COURSE OF ACTION - Monitor the effects of the Route 9 at Damon Road intersection reconfiguration and the future reconstruction of Damon Road. Review any design plans for the reconstruction project for Damon Road.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Ludlow and Springfield

PROBLEM LOCATION - Route 21(Parker Street) from North Branch Parkway to East Street.

PROBLEM DESCRIPTION - There are three problem locations along this corridor. The Boston Road at Parker Street four way signalized intersection has traffic delays due to high vehicle volumes at all approaches with the PM peak period being the most severe. Another problem location in the vicinity of this intersection is about .5 miles north of the Boston Road at the Parker Street intersection with Oak Street. The narrowing of Parker Street under a railroad bridge in conjunction with poor pavement surface condition causes vehicles to significantly reduce speed in both directions. Northbound vehicles traveling on Parker Street are obstructed by vehicles turning left (westbound) onto Oak Street. Since Oak Street is an unsignalized intersection, this is a difficult movement to make. The third location of congestion is the Route 21 bridge over the Chicopee River. This bridge has one lane in each direction widening to two at the approaches on each end of the bridge. This bridge has a short span (approximately .1 miles) and a traffic control signal at both ends. Large vehicles consume most of the travel space on the bridge and cause vehicles to queue over the bridge and impact the intersections approaches at both ends.

CURRENT ACTIVITIES - The reconstruction of Parker Street from Boston Road to Main Street is programmed in the Pioneer Valley Transportation Improvement Program. This will include resurfacing Parker Street from Boston Road to Main Street. Traffic control signals will be installed at the intersections of Parker Street with Oak and Verge Streets. This will also include replacing the Conrail bridge over Parker Street. Rehabilitation of Bridge (L-16-008) over the Chicopee River connecting Springfield and Ludlow is identified in the Pioneer Valley Transportation Improvement Program. This may include additional capacity through roadway widening in the Route 21 bridge project. The reconstruction of Shawinigan Drive in Chicopee and Ludlow could provide an alternate route for the Route 21 bridge traffic.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - A conceptual plan for a second bridge crossing to connect Sewall Street with Stony Hill Road has been discussed for many years. As proposed, the two bridges would operate as one-way pairs across the Chicopee River. This alternative will be studied using the PVPC's regional transportation model.

PVPC RECOMMENDATION - Monitor the effects of all current activities as part of the congestion management system. The second bridge alternative will be analyzed as part of the update to the regional transportation plan. A Major Investment Study will be recommended should the monitoring program indicate that additional measures to alleviate congestion are required in this area.

JURISDICTION -The city of Springfield has jurisdictional responsibility for Parker Street and the state of Massachusetts has jurisdictional responsibility for the Route 21 bridge connecting Springfield and Ludlow.

NEXT COURSE OF ACTION - Monitor the effects of the improvements identified in the current activities section. Study the proposed new bridge alternative as part of the regional transportation plan.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Springfield

PROBLEM LOCATION - Magazine Street and Armory Street from Worthington Street to the Armory Street rotary including Interstate - 291 on and off ramps.

PROBLEM DESCRIPTION - The congestion along this corridor is primarily due to the intersection of Armory Street and Genessee Street. This intersection has three approaches and is controlled by a traffic signal. The northbound and southbound approaches of Armory Street are the most severe. This is due to a high volume of traffic and the existing signal timing. Just north of the intersection is an Interstate 291 (I-291) interchange providing access to and from the eastbound and westbound directions of I-291. This intersection is just north of the Springfield Armory Museum and in close proximity to Springfield College and the American International College. The narrow width of the existing bridges and older traffic signal equipment also contribute to congestion in this area.

CURRENT ACTIVITIES - There are no improvement projects currently scheduled for this location.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - This area is an excellent candidate for further study as part of the PVPC's local technical assistance program. As part of this study changes to the existing signal timing, phasing and geometry could be tested.

PVPC RECOMMENDATION - Traffic volumes and accident data will be collected as part of PVPC's local technical assistance program. This location will then be analyzed and draft recommendations for improving congestion in this area will be forwarded to the city of Springfield and the Massachusetts Highway Department District 2 office.

JURISDICTION - The state of Massachusetts has jurisdictional responsibility for the I - 291 ramps and the Armory Street rotary. The city of Springfield has jurisdictional responsibility for Magazine Street and Armory Street south of Chandler Street.

NEXT COURSE OF ACTION - Study the location as discussed above. Upon completion of the study, schedule a meeting with the city of Springfield and the Massachusetts Highway Department to discuss potential improvement alternatives for this location.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Springfield

PROBLEM LOCATION - Route 20A (Page Boulevard) from East Street to Oakdale Street

PROBLEM DESCRIPTION - The traffic congestion along this roadway is primarily due to the four way signalized intersection of Route 20A, Robbins Road and Cadwell Drive. Page Boulevard provides access to and from Interstate 291 west of the intersection. The Route 20A eastbound and westbound approaches to this intersection are the most severe. Route 20A eastbound has three approach lanes that include an exclusive left turn lane, exclusive through lane and a through/right turn lane. The Cadwell Street approach has an exclusive right turn lane and a shared through/left turn lanes. The Robbins Road northbound approach has a shared through/left turn lane and an exclusive right turn lane providing access to the Memorial Industrial Park. Traffic can queue back onto Interstate 291 eastbound via the eastbound Indian Orchard off ramp during peak hours. Vehicles from the Interstate 291 eastbound off ramp also have difficulty merging onto Page Boulevard since they have a short distance to maneuver into the appropriate lane at the Robbins Road intersection. Pavement condition in this area is poor due to rutting which slows the movement of traffic especially in the westbound direction. This can be attributed to heavy vehicles using the industrial park south of the intersection. Page Boulevard east of this intersection has two travel lanes in each direction. These lanes are narrow and tend to slow the flow of traffic if there are large vehicles using the roadway.

CURRENT ACTIVITIES - This area is currently being studied by a private consultant for the city of Springfield.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The recommendations of the ongoing study at this locations should be implemented by the Massachusetts Highway Department and the city of Springfield.

PVPC RECOMMENDATION - Assist the city of Springfield in the advancement of the recommendations of the Route 20A study.

JURISDICTION - The state has jurisdictional responsibility for Page Boulevard from Roosevelt Avenue to the intersection with Robbins Road and Cadwell Drive including the access ramps to and from Interstate 291. The city of Springfield has jurisdictional responsibility for Robbins Road, Cadwell Drive and Route 20A east of this intersection and west of Roosevelt Avenue.

NEXT COURSE OF ACTION - Meeting with the Massachusetts Highway Department and city of Springfield upon completion of the study to discuss the implementation of the recommendations of the traffic study.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC and the city of Springfield

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Springfield**PROBLEM LOCATION - Sumner Avenue from Forest Park Avenue to White Street**

PROBLEM DESCRIPTION - Sumner Avenue is on a east/west alignment scattered with retail and residential land uses and serves as a connector for eastern parts of Springfield, Wilbraham. Interstate 91, Route 5 and the south end bridge connecting points west of the Connecticut River. The most severe congestion along this roadway occurs at the intersection of Sumner Avenue, Route 83 (Belmont Avenue), Dickinson Street, Draper Street and Lenox Street. Route 83 (Belmont Avenue) is on a north/south alignment connecting downtown Springfield, East Longmeadow and northern Connecticut. These two roadways attract large volumes of traffic especially during the AM and PM peak hours and cross at their intersection with Lenox Street, Dickinson Street and Draper Street which is known as the "X". This causes large traffic queues and excessive delay to vehicles that have to navigate through this intersection. Sumner Avenue has two travel lanes in each direction with on-street parking in various locations. A second location of less severe congestion is the four way signalized intersection of Sumner Avenue, Beechwood Avenue and Fort Pleasant Avenue. Delays here are due to the large volume of traffic and close proximity to the signalized intersections of Sumner Avenue at Longhill Street and Sumner Avenue at Forest Park Avenue. These three intersections are approximately .3 miles apart from each other and therefore cause a significant amount of stop and go traffic.

CURRENT ACTIVITIES - Reclamation and resurfacing of Route 83 (Belmont Avenue) from Fort Pleasant Avenue to Sumner Avenue is programmed in the Pioneer Valley Transportation Improvement Program.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - A further traffic study is recommended to investigate alternatives to reduce congestion. The city of Springfield developed a conceptual improvement plan for this area several years ago. This plan failed to receive adequate public support as was subsequently abandoned. Prior to the development of any proposed improvements to this area, a meeting should be scheduled between the existing business owners and residents to discuss their needs.

PVPC RECOMMENDATION - Further study is required in this area. Prior to the development of any proposed improvements to this area, a meeting should be scheduled between the existing business owners and residents to discuss their needs.

JURISDICTION - The city of Springfield has jurisdictional responsibility for Sumner Avenue and intersecting streets within the study area.

NEXT COURSE OF ACTION - Meeting with the city of Springfield, Massachusetts Highway Department District 2, local business owners and concerned citizens to discuss the problems and needs for this area.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Springfield**PROBLEM LOCATION - Main Street and Locust Street from Gardner Street to Belmont Avenue**

PROBLEM DESCRIPTION - This area is located just south of the downtown area in the city of Springfield referred to as "The South End". There are two primary causes of congestion in this area. One is the series of four traffic signals within a .5 mile segment along Main Street between State Street and Gardner Street that lack proper coordination. This causes a large amount of stop and go traffic and results in excessive travel delay. There are "SLOW CONGESTED AREA" signs posted along this segment of roadway. The second location is the intersection of Locust Street, Mill Street, Fort Pleasant Avenue and Belmont Avenue. This is a six way intersection controlled by two coordinated traffic control signals. It operates as two intersections with approximately a 100 foot space between the two. The configuration of the intersection is confusing to drivers since there are six intersecting streets and two traffic controls. Drivers have problems determining how to navigate through this area causing slow movement of vehicles and therefore congestion.

CURRENT ACTIVITIES - There are no improvement projects currently scheduled for this location.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The four traffic signals on Main Street between State Street and Gardner Street should be coordinated. This will improve the movement of vehicles along Main Street reducing unnecessary delays due to stop and go traffic at these intersections. The six way intersection of Locust Street, Mill Street, Fort Pleasant Avenue and Belmont Avenue should be redesigned and reconstructed. Approaches should be better aligned with pavement markings indicating movements allowed for each approach lane. Optimization and relocation of the traffic controls should be done to improve efficiency of the intersection and reduce driver confusion. Any proposed changes in this area would require new traffic control equipment.

PVPC RECOMMENDATION - Study the effects of coordinating the four traffic signals in this area as part of the PVPC's local technical assistance program.

JURISDICTION - The city of Springfield has jurisdictional responsibility for all roads identified in the study area.

NEXT COURSE OF ACTION - Begin the data collection required to conduct the signal coordination study.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - Low

COMMUNITY - Springfield**PROBLEM LOCATION - Intersection of Plainfield Street, Avacodo Street and Route 20.**

PROBLEM DESCRIPTION - The signalized intersection of Plainfield Street, Avacodo Street and Route 20 becomes very congested typically during the AM and PM commute hours. The eastbound and westbound directions of Route 20 are the most severe. During the AM commute period the eastbound direction is most severe and westbound direction is most severe during the PM period. The Route 20 approaches are on a slight incline and have severe rutting in the pavement. This poor pavement creates a very bumpy ride and slows the movement of traffic through the intersection. During the morning commute traffic queues along Route 20 eastbound over the Connecticut River bridge into the West Springfield Route 20 and Route 5 rotary. The evening commute period has traffic queuing along Route 20 westbound past the Interstate 91 entrance and exit ramps. This creates difficulty for traffic merging onto Route 20 westbound and accessing Interstate 91 northbound. The northbound Avacodo Street and southbound Plainfield Street approaches didn't appear to have any congestion problems. This intersection is located at crossroads of major commuter routes including Route 20, Interstate 91 (northbound & southbound) and Interstate 291 eastbound. The Route 20 approaches both have an exclusive left turn lane, exclusive through lane and a shared through right turn lane. The Plainfield Street and Avacodo Street approaches both have a shared through/left/right turn lane.

CURRENT ACTIVITIES - The intersection of Plainfield Street, Avacodo Street and Route 20 could potentially be improved as part of the design of the Connecticut Riverwalk Project.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - This intersection should be reconstructed to improve the pavement surface and subbase which will allow for a smoother ride through the intersection. Retime the traffic signal for the AM and PM peak hours and upgrade existing signal equipment as appropriate. The city of Springfield recommends the installation of cement concrete pavement in this area.

PVPC RECOMMENDATION - The existing reconstruction project on the I-91 ramps in Springfield prohibits immediate attention to this problem. The Massachusetts Highway Department District 2 office should conduct a feasibility study for installing cement concrete pavement in this area.

JURISDICTION - The city of Springfield has jurisdictional responsibility for the roadways in the vicinity of the intersection. The state has jurisdictional responsibility for the Route 20 bridge over the Connecticut River and the Route 5 at Route 20 rotary.

NEXT COURSE OF ACTION - Meet with the city of Springfield and the Massachusetts Highway Department to discuss the potential for reconstructing this roadway.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - West Springfield

PROBLEM LOCATION - Route 5 (Riverdale Street) from Ashley Avenue to Morgan Road.

PROBLEM DESCRIPTION - This portion of Route 5 (Riverdale Road) has significant retail land uses especially on the east side of the roadway. There are three locations of severe congestion along this portion of Route 5 two of which are directly related. One location is the Interstate 91 (I-91) Exit 13B off ramp intersecting the southbound direction of Route 5. Vehicles have difficulty merging onto Route 5 southbound causing traffic queues along the exit ramp back to Interstate 91. This is due to heavy volumes of traffic along Route 5 southbound and limited sight distance in the northbound direction at the I-91 overpass. The second location is the entrance to the Riverdale Shops along the southbound direction of Route 5 at the signalized intersection of Route 5 at Daggett Drive and is related to the I-91 exit 13B problem. Route 5 southbound widens at this approach to provide an additional two left turning lanes for a one way entrance into the Riverdale Shops and for U - turns onto Route 5 northbound. This is the first entrance for southbound traffic on Route 5 into the Riverdale Shops and adjacent shopping areas since Route 5 is a divided highway in this location. Once these two left turn storage lanes fill, vehicles spill over onto Route 5 and block traffic exiting from I-91 at Exit 13B. This further intensifies the problem on the I-91 exit ramp. Reasons for the large traffic queues at the Route 5 and Daggett Drive intersection are the large volume of traffic along Route 5 southbound and traffic congestion within the parking lots of the shopping areas spilling over into Route 5. The third problem location is the four way signalized intersection of Morgan Road at Route 5 and Riverdale Shops. Route 5 northbound is a five lane approach with two exclusive left turn lanes, two through lanes and an exclusive right turn lane. Route 5 southbound is a four lane approach with an exclusive left turn, exclusive right turn and two through lanes. Morgan Street eastbound is a three lane approach with an exclusive left turn lane, shared through/left turn lane and a shared through/right turn lane. All approaches are severely congested with the exception of the Route 5 southbound approach. The reason for this is this intersection serves a main entrance/exit to the Riverdale Shops for traffic from the south and east. Traffic from the north typically uses the Daggett Drive entrance. Therefore southbound approach at the Morgan Street intersection is less severe of a problem.

CURRENT ACTIVITIES - A engineering consultant has been contracted to study traffic flow along this portion of Route 5 and within the Riverdale Shops. The signalization of the intersection of Route 5 southbound and the exit 13 B off ramp from Interstate 91 is scheduled to be advertised in 1996.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The PVPC is currently involved with an active committee to assist in developing a preferred alternative to mitigate traffic congestion in this area.

PVPC RECOMMENDATION - PVPC will continue to assist the Massachusetts Highway Department and community in this area in advancing the preferred alternative to the project level

JURISDICTION - The state has jurisdictional responsibility for Route 5 (Riverdale Road) and Interstate 91 interchange 13.

NEXT COURSE OF ACTION - Continue efforts with the Riverdale Shops committee, community of West Springfield and Massachusetts Highway Department.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - West Springfield

PROBLEM LOCATION - Route 20 from Kings Highway to the Rotary at Route 20 and Route 5.

PROBLEM DESCRIPTION - There are three locations of congestion along this corridor. The portion of Route 20 from the intersection of Westfield Street and Elm Street to the rotary at Route 5 and Route 20 is the most severe. The eastbound direction is more of a problem than the westbound. There is a series of two signalized intersection along a .1 mile long segment of Route 20 connecting Park Avenue (westbound) and Park Avenue (eastbound). These two signals are not always coordinated causing vehicles to queue and fill the roadway between the two intersections and beyond. When this happens traffic is not only impacted on Route 20 eastbound but Park Street westbound is hindered by these vehicles. Park Street westbound can also have traffic queues extending into the Route 20 at Park Street (westbound) intersection obstructing vehicles traveling eastbound on Route 20. Another problem location is along Route 20 eastbound at the Route 5 and Route 20 rotary. The signalized intersection of Route 20 at Main Street is just west of the entrance to this rotary. During the morning commute this rotary can fill with vehicles due to traffic on the North End Bridge heading into Springfield. When this happens vehicles queue from the rotary entrance along Route 20 (eastbound) through its intersection with Main Street and beyond. The third problem location is along Route 20 from its intersection with Chestnut Street to Kings Highway. The reason for delays here is that Route 20 narrows from four to two lanes with some on street parking allowed. Vehicles merging as the road narrows will slow the progression of traffic.

CURRENT ACTIVITIES - Rehabilitation of the traffic signals at the intersections of Route 20 with Chestnut Street and Second Street is programmed in the Pioneer Valley Transportation Improvement Program. The Town of West Springfield currently has plans to improve the traffic signals at the intersection of Park Avenue with Union Street and Elm Street. The Town of West Springfield has plans to improve the existing pavement markings on Park Avenue. The PVPC has started the data collection phase for a Route 20 Corridor Study from the Route 5/20 rotary in West Springfield to the center of Westfield.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The Route 20 Corridor Study will analyze the existing and future deficiencies along this corridor. The potential improvements for this area are expected to be taken from the recommendations of the Route 20 Corridor Study. The study will be guided by a committee of local residents, business owners, and officials and a wide range of multi-modal strategies will be analyzed.

PVPC RECOMMENDATION - The preferred recommendations of the Route 20 Corridor Study should be implemented by the appropriate party.

JURISDICTION - The community of West Springfield has jurisdictional responsibility for Route 20 east of the intersection with Kings Highway to the Route 5 rotary. The state of Massachusetts has jurisdictional responsibility for Route 20 west of Kings Highway and the Route 20 and Route 5 rotary.

NEXT COURSE OF ACTION - Complete the Route 20 Corridor Study.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Westfield

PROBLEM LOCATION - *Mechanic Street and Meadow Street from Route 20 to Route 10/202.*

PROBLEM DESCRIPTION - Mechanic Street serves as a connection from Route 20 to Route 10/202 via Meadow Street. The city's largest church and associated parochial school are located here creating traffic during both weekday and weekend periods. Mechanic Street is a narrow roadway with on-street parking allowed which impacts the flow of traffic. Bartlett Street which connects to Route 10/202 intersects Mechanic Street is also a problem since both roads are very narrow. Another problem location along this corridor is the intersection of Mechanic Street and Meadow Street. Northbound traffic on Meadow Street typically queues from its intersection with Route 10/202 beyond the Mechanic Street intersection. This blocks traffic on Mechanic Street trying to access Meadow Street northbound to Route 10/202.

CURRENT ACTIVITIES - Reconstruction of the existing Routes 10 and 202 bridge over the Westfield River is programmed in the Pioneer Valley Transportation Improvement Program. This may include construction of a twin bridge with one way traffic flow on each. The city of Westfield has identified this location as a problem and is considering improvement strategies. This area is currently being studied as part of the PVPC's Route 20 Corridor Study.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The City of Westfield would like to study traffic calming measures along Mechanic Street and Washington Street to determine if cut-through traffic can be diverted from this area. Additional treatments can be analyzed as part of the Route 20 Corridor Study.

PVPC RECOMMENDATION - The preferred recommendations of the Route 20 Corridor Study should be implemented by the appropriate party.

JURISDICTION - The city of Westfield has jurisdictional responsibility for Mechanic Street and Meadow Street. The state of Massachusetts has jurisdictional responsibility for the Route 10/202 bridge.

NEXT COURSE OF ACTION - Complete the Route 20 Corridor Study.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC.

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Westfield**PROBLEM LOCATION - Route 10/202 from Route 20 (Main Street) to Sunset Drive.**

PROBLEM DESCRIPTION - There are two locations of severe traffic congestion along this corridor. One is the segment of Route 10/202 between Franklin Street and Pochassic Street. Route 10/202 varies from one to two lanes in each direction. The three way signalized intersection of Route 10/202 and Franklin Street (Route 20) is a very busy location. There are traffic queues on each approach due to large volumes of traffic which impact side street access. Routes 10/202 from this intersection east to the Westfield River bridge is the downtown area in Westfield. There is on street parking and local businesses along both sides of the roadway. Traffic can queue and fill this .5 mile long roadway in both directions. Drivers typically had to wait through two cycles of the traffic signal at the Meadow Street eastbound approach to gain access to the Route 10/202 bridge during data collection. The intersection of Route 10/202 with Pochassic Street is another problem intersection. This is a four way signalized intersection just east of the Route 10/202 bridge. There was a large volume of traffic observed on this street accessing Route 10/202 during data collection. The second problem location was along the northbound approach of Routes 10/202 at the intersection with the Massachusetts Turnpike Pike interchange #3. This two lane roadway widens at the approach from two travel lanes to three. The northbound approach being the most severe has two through lanes and one exclusive left turn lane for access to the Massachusetts Turnpike. Vehicles traveling to the Massachusetts Turnpike would fill the left turn storage lane and spill over into the two lane portion of Routes 10/202 blinking through traffic.

CURRENT ACTIVITIES - Routes 10/202 from Notre Dame Avenue to the Massachusetts interchange #3 is currently under reconstruction. This project includes roadway widening and improvements to the intersection with the Massachusetts interchange #3. Reconstruction of the existing Routes 10 and 202 bridge over the Westfield River is programmed in the Pioneer Valley Transportation Improvement Program. This may include construction of a twin bridge with one way traffic flow on each. A Route 20 Corridor Study to be conducted by the PVPC will include the section of Route 10/202 from Main Street to Meadow Street.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The Route 20 Corridor Study will analyze the existing and future deficiencies along Route 10/202 from Main Street to Meadow Street. The potential improvements for this area are expected to be taken from the recommendations of the Route 20 Corridor Study. The study will be guided by a committee of local residents, business owners, and officials and a wide range of multi-modal strategies will be analyzed.

PVPC RECOMMENDATION - The preferred recommendations of the Route 20 Corridor Study should be implemented by the appropriate party.

JURISDICTION - The city of Westfield has jurisdictional responsibility for Route 10/202 west of the Conrail bridge south of Arch Road with the exception of the Route 10/202 bridge. The State of Massachusetts has jurisdictional responsibility for Route 10/202 north of the Conrail bridge south of Arch Road.

NEXT COURSE OF ACTION - Complete the Route 20 Corridor Study. Monitor the future impacts to the northern portion of Route 10/202 once the reconstruction project is completed.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Westfield**PROBLEM LOCATION - Route 20 from East Mountain Road to Westfield Shops Main Entrance.**

PROBLEM DESCRIPTION - The severe traffic congestion along this corridor occurs between two signalized intersections approximately .2 miles apart. The roadway section between them has two narrow travel lanes in each direction, with one bridge (BR# W-25-004) and one viaduct. The intersection of Route 20 with Route 187 and the Caldor shopping store access drive is a four way signalized intersection. The Route 20 westbound approach to Route 187 has one lane primarily used for through and right turns and one lane for through and left turns onto Route 187. The left turn movement onto Route 187 has a short protected phase. Once unprotected this movement is difficult to make due to the high volume of through traffic on Route 20 in the eastbound direction. This causes traffic to queue over the bridge and viaduct into the next signalized intersection (Union Street) which interferes with its operation. The intersection of Route 20 with Union Street is the second intersection on this stretch of roadway. This is a three way signalized intersection with the eastbound approach of Route 20 being the most severe problem. This is a two lane approach with one lane primarily used for through and one for left turn movements onto Union Street. Left turn movements are difficult to perform during their permitted green phase. This causes traffic to queue along the viaduct and bridge into the Route 187 intersection, and interfering with its operation. Other approaches to these intersections are congested but not as severe.

CURRENT ACTIVITIES - Massachusetts Highway Department is currently studying replacement of the viaduct and improvements to bridge (BR# W-25-004). The effects of widening this bridge can be analyzed as part of the PVPC's Route 20 Corridor Study.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - The Route 20 Corridor Study will analyze the existing and future deficiencies along Route 20 in this area. The potential improvements for this area are expected to be taken from the recommendations of the Route 20 Corridor Study. The study will be guided by a committee of local residents, business owners, and officials and a wide range of multi-modal strategies will be analyzed.

PVPC RECOMMENDATION - The preferred recommendations of the Route 20 Corridor Study should be implemented by the appropriate party.

JURISDICTION - The state of Massachusetts has jurisdictional responsibility for this portion of Route 20. The city of Westfield has jurisdictional responsibility for Union Street and Route 187.

NEXT COURSE OF ACTION - Complete the Route 20 Corridor Study.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Westfield

PROBLEM LOCATION - *Washington Street and Franklin Street from Court Street to Elm Street.*

PROBLEM DESCRIPTION - There are three signalized intersections along this corridor that are problem locations. Court Street at Washington Street is a three way signalized intersection with the one lane approach of Washington Street at Court Street being the most severe. Difficulty accessing Court Street causes vehicles to queue beyond adjacent intersections blocking side street traffic. The three way signalized intersection of Washington Street and Franklin Street has a similar problem. The left turn movements from the one lane approach of Washington Street create delays for heavy right turn movements. Traffic queues caused by this also interfere with side street traffic along Washington Street. The third problem location is eastbound approach of Franklin Street (Route 20) at its intersection with Route 10/202. This is a three way signalized intersection with Route 20 eastbound bringing in traffic from the hilltown areas. Problems with this approach are due to the heavy volume of traffic accessing Route 10/202.

CURRENT ACTIVITIES - Reconstruction of the existing Routes 10 and 202 bridge over the Westfield River is programmed in the Pioneer Valley Transportation Improvement Program. This may include construction of a twin bridge with one way traffic flow on each. The PVPC is currently in the process of a Route 20 Corridor Study from the Route 5/20 rotary in West Springfield to the center of Westfield.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - Alternatives for alleviating congestion in this area can be analyzed as part of the Route 20 Corridor Study.

PVPC RECOMMENDATION - The preferred recommendations of the Route 20 Corridor Study should be implemented by the appropriate party.

JURISDICTION - The city of Westfield has jurisdictional responsibility for Washington Street and Franklin Street in this area.

NEXT COURSE OF ACTION - Complete the Route 20 Corridor Study. Monitor the effects of the reconstruction of the Route 10/202 bridge.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

COMMUNITY - Wilbraham**PROBLEM LOCATION - Stony Hill Road from Springfield Street to River Road**

PROBLEM DESCRIPTION - Left turning traffic backs up at the intersections of Stony Hill Road with Boston Road (Route 20) and Stony Hill Road with Springfield Street due to the lack of exclusive left turns lanes and dedicated left turn phasing at these intersections. Congestion occurs at the intersection of Stony Hill Road and River Road due to an unusual intersection alignment.

CURRENT ACTIVITIES - Several projects in this area are currently programmed in the Pioneer Valley Transportation Improvement Program. These include: improvements at the intersection of Boston Road (Route 20) with Stony Hill Road; improvements at the intersection of Stony Hill Road with Springfield Street; and the reconstruction of Stony Hill Road and realignment of its intersection with River Road.

POTENTIAL IMPROVEMENT ALTERNATIVES/STRATEGIES - No potential improvements have been identified as projects are currently proposed for all three problem locations.

PVPC RECOMMENDATION - Monitor the effects of the proposed improvement projects in this area.

JURISDICTION - The Massachusetts Highway Department has jurisdiction over the intersection of Boston Road (Route 20) with Stony Hill Road. The Town of Wilbraham has jurisdiction over Stony Hill Road.

NEXT COURSE OF ACTION - Monitor the effects of the proposed improvement projects in this area.

PARTY RESPONSIBLE FOR NEXT STEP - PVPC

PRIORITY - To be determined by the Pioneer Valley Joint Transportation Committee.

Summary of Needs

The Location Specific Summary sections identified the current activities associated with all verified CMS problem locations. Most activities consist of projects programmed in the current Pioneer Valley Transportation Improvement Program. Not all of these projects are geared toward congestion relief and therefore will not alleviate the existing congestion problem. Therefore, the CMS locations were separated into two groups. The first group consists of CMS locations that have projects planned which could alleviate the existing congestion problem and are presented in Table 3. These locations will remain on the CMS list and be monitored for the projects impacts before and after implementation. The second group consists of all locations that currently have no specific congestion mitigation project planned and are presented in Table 4. These locations will require additional study so improvement alternatives can be developed and projects initiated.

Table 3
Needs Potentially Satisfied

COMMUNITY	LOCATION	ASSOCIATED IMPROVEMENT PROJECT
Agawam	Route 57	Next phase of Route 57 in Southwick
Agawam	Route 75	Reconstruction and widening of Route 75
Agawam/Springfield	Route 5	Reconstruction of the South End Bridge
Chicopee	Prospect Street	Intersection Improvements at two locations
Holyoke	Westfield Rd & Homestead Ave.	Traffic Mitigation for Holyoke Mall expansion
Hadley/Northampton	Rte. 9 (Calvin Coolidge Bridge)	Widening of Route 9 and the Calvin Coolidge Bridge
Ludlow/Springfield	Route 21	Reconstruction of Route 21 & Route 21 Bridge
Northampton	Damon Road	Recon. of Damon Rd./Rte 9 intersection imp. complete
Northampton	Route 10	Signalization of the Old South Street Intersection
Springfield	Route 20A (Page Boulevard)	Currently under study by a private consultant
West Springfield	Route 5	Currently under study by a private consultant
West Springfield	Route 20	PVPC Route 20 Corridor Study
Westfield	Mechanic St. & Meadow St.	PVPC Route 20 Corridor Study
Westfield	Washington St. and Franklin St.	PVPC Route 20 Corridor Study
Westfield	Route 20	PVPC Route 20 Corridor Study
Westfield	Route 10/202	Reconstruction of Rte 10/202 & Westfield River Bridge
Wilbraham	Stony Hill Road	Intersection Improvements at two locations

Table 4
Existing Unmet Needs

COMMUNITY	LOCATION	LIMITS
Agawam	Route 147 and Route 159	Rowley Street to Federal Street
East Longmeadow	Route 83	Harkness Avenue to Dearborn Street
East Longmeadow	Downtown Rotary	Seven Leg Rotary
Longmeadow	Route 5	Forest Glen Road to Williams Street
Northampton	Route 9	Hawley St./Market St. to Prospect St.
Springfield	Magazine St. and Armory St.	Worthington Street to Armory Street/I-291 Rotary
Springfield	Main Street and Locust Street	Fremont Street to Belmont Avenue
Springfield	Route 20	Rte. 20/Plainfield Street/Avacado St. Intersection
Springfield	Sumner Avenue	Forest Park Avenue to White Street

Table 5 is a summary of the CMS locations verified and the jurisdictional responsibility of the location and related roads.

Table 5
Problem Locations Identified
Jurisdiction Summary

COMMUNITY	LOCATION	JURISDICTION		
		LOCAL	STATE	JOINT
Agawam	Route 147 and Route 159			X
Agawam	Route 75			X
Agawam	Route 57	X		
Agawam/Springfield	Route 5		X	
Chicopee	Prospect Street	X		
East Longmeadow	Route 83	X		
East Longmeadow	Downtown Rotary	X		
Hadley/Northampton	Rte. 9 (Calvin Coolidge Bridge)		X	
Holyoke	L. Westfield Rd. and Homestead Ave.			X
Longmeadow	Route 5	X		
Ludlow/Springfield	Route 21			X
Northampton	Damon Road			X
Northampton	Route 10	X		
Northampton	Route 9	X		
Springfield	Magazine Street and Armory Street			X
Springfield	Main Street and Locust Street	X		
Springfield	Route 20A (Page Boulevard)			X
Springfield	Route 20			X
Springfield	Sumner Avenue	X		
West Springfield	Route 5	X		
West Springfield	Route 20			X
Westfield	Mechanic Street and Meadow Street			X
Westfield	Route 10/202			X
Westfield	Washington Street and Franklin Street			X
Westfield	Route 20	X		
Wilbraham	Stony Hill Road			X

Improvement strategies will be developed in conjunction with the appropriate parties depending on the jurisdictional responsibility. For example CMS locations under local jurisdiction, the appropriate community members (i.e. DPW director, Community Engineer, Community Planner) will be involved with final strategy development and project initiation. CMS locations under state jurisdiction will require consultation with the appropriate Massachusetts Highway Department District Office to develop appropriate strategies. If the location is under joint jurisdiction of the state and community, then both parties will be brought together to study the problem.

Sequence of Strategy Development and Prioritization

Developing improvement strategies will be a joint effort between the PVPC, the affected community(s), the EOTC, the PVTA, the Massachusetts Highway Department and any other appropriate organization where applicable. Initial strategies will be developed by the PVPC staff and presented to the effected community(s) for discussion. These initial strategies will then be redefined following the consultation meetings with the communities. Once these initial strategies have been refined and gained community support, site specific data collection will begin to test the various alternatives. In the case of Massachusetts Highway Department jurisdiction locations, an initial list of problem locations will be sent to the applicable district office. If there are no projects currently planned to alleviate these congested locations, PVPC will conduct analysis on initial strategies developed in consultation with the highway department. This will be sent to the applicable district office for review and comment. Prioritization of projects will be based on support, participation and commitment from the respective communities or highway department district office.

Community support will be based on prior participation in the CMS development process and commitment gained from initial consultation meetings. Local participation in the CMS process is done through the Pioneer Valley Joint Transportation Committee (JTC). This was accomplished by solicitation of congested locations through the JTC by a survey that will also assist in development of the Regional Transportation Plan (RTP). The JTC was also asked to review the initial list of locations and submit any they thought should be included.

Communities will be required to prioritize their locations as they see appropriate. Once this is accomplished all locations will be examined for the complexity of the project. The Pioneer Valley JTC will then make the final decision on the order in which locations will be examined by the PVPC. PVPC staff will conduct a study and test the improvement strategies developed. Appropriate findings from the CMS process will be incorporated in the RTP. PVPC will assist the community(s) in applying for funds to implement projects resulting from the CMS process. Since the Transportation Improvement Program (TIP) is used as a management tool to monitor progress of the RTP, it will be the primary means to acquire funds for implementing CMS projects.

Project Initiation and Implementation

As previously mentioned projects resulting from the CMS process will be included in the RTP and proceed through the TIP process for implementation. In order to accomplish this the following draft series of actions will act as a guide for each project.

- The PVPC transportation staff will meet with the impacted community(s) to present initial congestion relief strategies. This meeting will be established through the community's Joint Transportation Committee member and include appropriate persons (i.e. DPW directors, planning department members etc.). If possible, a representative from the Massachusetts Highway Department will be present. This meeting will further educate the CMS process and development of initial improvement strategies.
- Results from this meeting will be summarized including initial improvement strategies.
(Product: initial congestion relief strategies).
- The PVPC staff will conduct or arrange the necessary data collection and analysis for the recommended strategies.
- The PVPC staff will summarize findings and make recommendations to the community(s).
(Product: letter report summarizing analysis, findings and recommendations).
- Present recommendations to the community through a local public meeting or select board meeting. This will allow the public an opportunity to provide any input to the project and present any concerns so they may be addressed as soon as possible.

- Following this meeting a community endorsed conceptual project will be established.
(*Product: conceptual congestion relief project*).
- Community will be given the most current Project Information Form (PIF) for completion and submit tal to the PVPC to program the project in a future year of the next TIP. The PIF contains information necessary to program the project in the TIP and makes project proponents aware of various issues (i.e. permits, land acquisition public hearings, etc.). This form must be completed and endorsed by the community's chief elected official to be eligible for inclusion in the TIP. A copy of the most recent PIF and the TIP guidebook are presented in the appendix. The guidebook will help community officials navigate through the TIP process.
(*Product: completed project information form*).
- Community submits letter signed by the chief elected official to the appropriate Massachusetts Highway Department (MHD) District Office defining the proposed project, including a problem description, the proposed solution and level of community support. This letter should mention the project resulted from the Pioneer Valley CMS. With this letter a copy of the following should be included: completed PIF submitted to the PVPC, any analysis done related to the project and any other applicable material.
- The MHD in conjunction with the community should develop and finalize a project scope.
- The MHD in conjunction with the community determine the funding source for project design (i.e. Chapter 90 or state funds).
- The MHD submits the project proposal to the Project Review Committee for review and approval.
- Once approved by the Project Review Committee the design process is initiated.
- As the project design, permitting and land taking progresses the project moves closer to the annual element in the TIP.
- Once the project is ready for advertisement it is programmed in the annual element of the TIP.
- The project is then advertised and implemented.

It should be noted this series of actions is preliminary and is subject to change. Projects on locations that are under state jurisdiction may follow a slightly different course of action

Regionwide Needs and Improvement Strategies

In addition to studying location specific traffic congestion problems, regionwide congestion relief strategies are being explored. These regionwide strategies will focus on alleviating traffic congestion on and the surrounding areas of the currently verified problem locations. As previously displayed all the CMS verified problem locations fall within the urban area boundaries of the Pioneer Valley Region. Therefore, initial efforts will concentrate in this region and the immediately surrounding area. The strategies will focus around the integration of transit service, park-and-ride lots and bicycle/pedestrian facilities. Each of these offer congestion relief benefits operating separately but will be more efficient if all are integrated with one another.

The Pioneer Valley Transit Authority (PVRTA) fixed route transit service primarily operates within the urbanized area on or within close proximity to identified CMS locations. All verified CMS problem locations were analyzed to determine the potential to utilize transit as part of congestion relief strategies. This information has been summarized and is presented in Table 6 and on the following map. As presented in Table 6, all CMS verified problem locations have transit service operating on or nearby with the exception of the South End Bridge connecting Springfield and Agawam. Therefore, strategies such as express peak hour bus service, bicycles on transit and connections to park-and-ride lots will be investigated as part of any CMS study.

The Pioneer Valley region currently has three existing bicycle and pedestrian facilities.

<u>Facility Name</u>	<u>Location</u>	<u>Length (Miles)</u>
Amherst Bikeway	Amherst	3.5
Northampton Bikeway	Northampton	2.5
Norwottuck Rail Trail	Amherst, Hadley, Northampton	8.5

A total of 14.5 miles of bicycle/pedestrian facilities exist in the region. Preliminary results of a user survey conducted on the Norwottuck Rail Trail indicates on a typical weekday 25 % of the users use the trail for non recreational purposes. This demonstrates that the trail is being used as an alternative to other modes of transportation such as the automobile. Therefore, the construction new facilities and the expansion of existing facilities is necessary in order to provide opportunities for using alternative modes of transportation. Currently there is a bicycles on transit pilot program being implemented in the Five College area in Amherst, Hadley and Northampton. This consists of transit buses being equipped with bicycle racks so a person can bicycle and use transit service to reach their destination. This program will be studied for its effectiveness and potential expansion throughout the region.

Table 6
CMS Problem Locations and Related Transit Service

COMMUNITY	FACILITY	TRANSIT SERVICING ROUTES	MAP LABEL
Agawam	Route 147 and Route 159	R-14, PP(Bradley)	1
Agawam	Route 75	R-14	2
Agawam	Route 57	R-14	3
Agawam/Springfield	Route 5 (South End Bridge)	None	4
Chicopee	Prospect St.	Y-22, P-21	5
East Longmeadow	Route 83	R-18	6
East Longmeadow	Downtown Rotary	R-18	7
Hadley/Northampton	Rte. 9 (Calvin Coolidge Bridge)	PP(Amh.-Noho.), 703, 303	8
Holyoke	Westfield Road & Homestead Ave	R-24, P-11, PP(Noho.-Spfld.)	9
Longmeadow	Route 5	409	10
Ludlow	Center Street	B-06	11
Ludlow/Springfield	Route 21	B-06, B-07, B-17, R-18	12
Northampton	Damon Road	PP(Amh.-Noho.), 703, 303	13
Northampton	Route 10	701, 702, 703, 706, 303	14
Northampton	Route 9	PP(Amh.-Noho.), 703, 303, 702, 701	15
Springfield	Magazine St. and Armory St.	G-03, B-12	16
Springfield	Main St. & Locust St.	G-01, G-02, G-5, G-8, R-16	17
Springfield	Route 20A (Page Boulevard)	B-09, G-02	18
Springfield	Route 20	R-10, P-20, PP(Noho.-Spfld.)	19
Springfield	Sumner Avenue	G-01, G-02, B-13, G-08, G-05, R-16	20
Springfield	Roosevelt Avenue	None	21
Springfield	Route 20A (Page Boulevard)	B-06	22
West Springfield	Route 5	P-20	23
West Springfield	Route 20 (Elm Street)	R-10, P-20, PP(Westfield State)	24
Westfield	Mechanic St. and Meadow St.	B-23, R-10, PP(Westfield State)	25
Westfield	Washington St. and Franklin St.	B-23	26
Westfield	Route 10/202	B-23	27
Westfield	Route 20	R-10, PP(Westfield State)	28

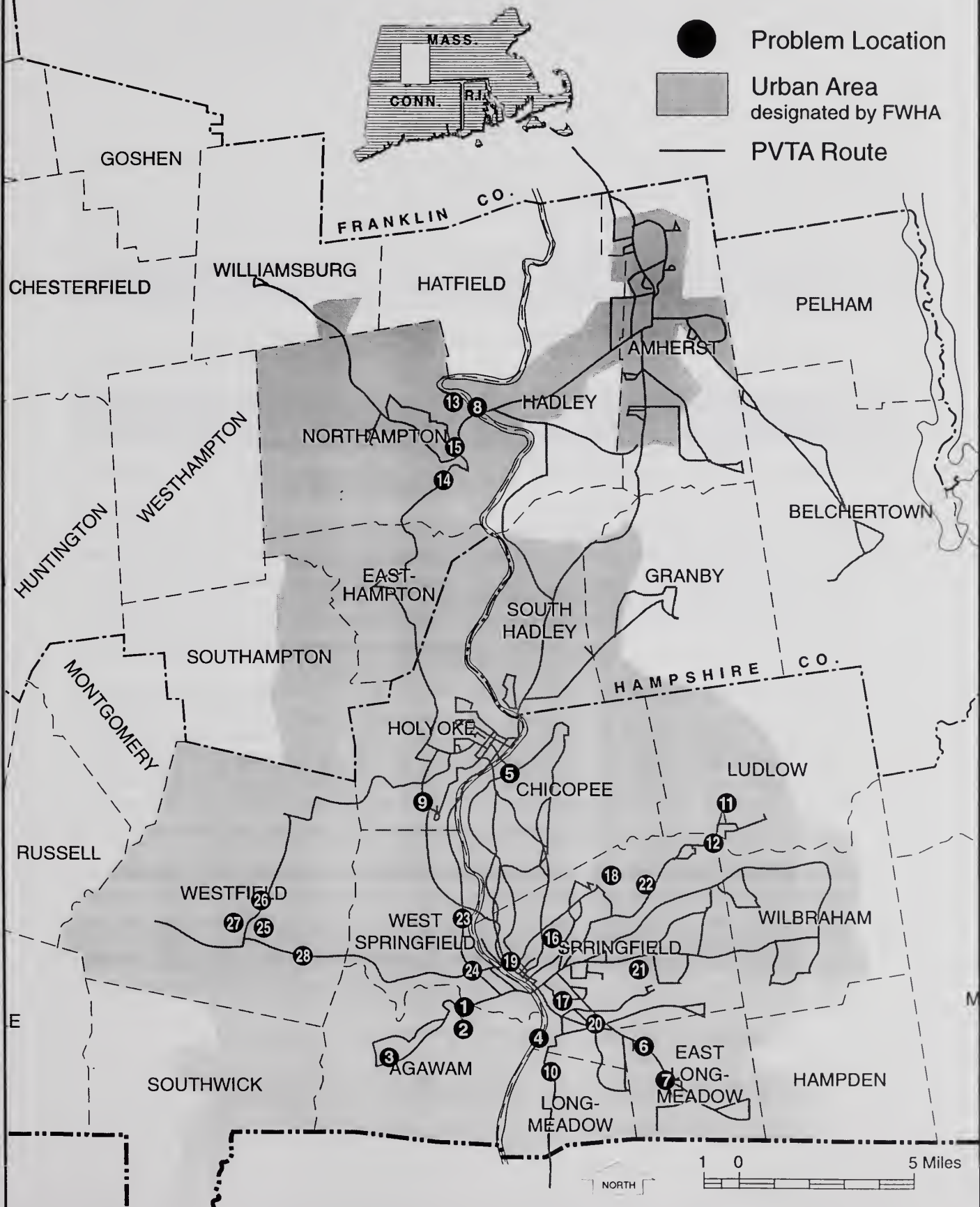
Source: PVPC

Expansion and further integration of transit, park-and-ride lots and bicycle/pedestrian facilities in the Pioneer valley Region will assist in alleviating traffic congestion on a region wide level. The majority of congestion problems in the region are most severe during the weekday AM and PM peak commuter periods and weekend afternoons. Therefore, emphasis will be placed on targeting strategies that increase ridesharing, use of transit service and non-motorized modes of transportation during these periods. The following five factors need to be addressed in order to make transit use more attractive in the Pioneer Valley Region.

- Dependability - Ensuring that schedules are adhered to and delays are minimal or non-existent.
- Convenience - Frequent service and numerous locations of access.
- Cost - Provide the minimal cost to users making a competitive alternative to the automobile.
- Comfort - Making the travel experience as comfortable as possible to users.
- Safety and Security - Provide users with the highest level of safety and security possible.

Pioneer Valley Region

Congestion Management System Problem Locations Identified



Park and Ride Lots

There are currently a total of five existing Park and Ride lots in the Pioneer Valley Region. Parking lots in Ludlow and Palmer were opened by the Massachusetts Turnpike Authority. Two parking lots in the city of Springfield operate in conjunction with PVTa bus routes. The fifth location is an old MHD Park and Ride lot at the Fairfield Mall in Chicopee which was observed to be in use by PVPC staff. A summary of the five existing Park and Ride lots is presented in Table 7.

Table 7
Park and Ride Lot Locations

Community	Location	# of Spaces	Average Occupancy	Lot Conditions	Safety Problem	Services Available	Parking Cost
Chicopee	Rte 33 at Fairfield Mall	*		Paved, Striped	No	PVTa Bus	No
Ludlow-MA Turnpike Exit 7	Rte 21 (Center Street) Rear of McDonald's	43	19	Paved, Striped Fenced	No	Food, Bike Racks	No
Palmer-MA Turnpike Exit 8	Rte 32 (Thorndike St.) Rear of McDonald's	34	15	Paved, Striped Fenced	No	Peter Pan Bus, Food	No
Springfield	Caldor Shopping Ctr. Allen & Cooley Sts.	*	9	Paved, Striped	No	PVTa Bus	No
Springfield	10 Centre Parking Lot Main St. under I-91	*		Paved, Striped Fenced	No	PVTa Bus	Yes

Data collection for Park and Ride lots locations consists of identifying the number of spaces occupied at the time of the inventory. Inventories were conducted on Tuesdays, Wednesdays and Thursdays after 9:00 AM and prior to 3:00 PM in the afternoon. The purpose of this data collection is to monitor usage and project future trends. Usage greater than 85% can indicate the lot may need expansion and usage less than 30% can indicate the location may need to be reassessed. During the next few months more extensive data collection for Park and Ride lots will be conducted.

Additional Park and Ride lots are proposed by the Massachusetts Turnpike Authority at Interchange 3 (Westfield), Interchange 4 (West Springfield) and Interchange 6 (Springfield). Once these lots are established, operational utilization data will be collected. Park-and-ride lots are also planned for the town of Hadley and the city of Northampton adjacent to Route 9 and in close proximity to Interstate 91 interchanges 18 & 19, downtown Northampton, the Northampton Bikeway, the Norwottuck Rail Trail, Hampshire and Mountain Farms Malls, and the University of Massachusetts - Amherst. Both facilities will provide commuter parking spaces, bicycle parking and transit service.

The following section describes each of the existing Park and Ride Lots and the proposed Park and Ride Lots in Hadley and Northampton in greater detail. Information is provided on the address of the lot; number of parking spaces; the condition of the lot; the safety of the lot; other services available at the lot; the cost of parking; the status of the Park and Ride Lot agreement; and any recommendations by PVPC. In addition, maps are provided showing directions to the parking lot, the location of existing and proposed trailblazing signs, and a diagram of the parking lot (if available).

A basic assumption that "people are lazy and always in a hurry" will be used. This means that the average person want to reach their destination as quickly as possible with the least amount of effort. Therefore the need for strategies such as express bus service during peak periods, increasing frequency of service during peak periods and providing stops in key locations will be explored.

Tied into the transit service will be park-and-ride lots to enhance ridesharing and bicycle and transit use. Currently there are five signed park-and-ride lots in the Pioneer Valley region. However there are numerous unofficial locations throughout the region that are being used. The following actions will be followed to enhance and expand upon park-and-ride lots in the region.

- Analysis of existing park-and-ride lots to determine usage, users existing problems and to determine estimates of future demand.
- Identifying shopping centers with extensive parking areas along major commuter roadways that have potential for a park-and-ride lot.
- Identify areas close to dense residential areas that could benefit from a park-and-ride lot.
- Maximize use of existing parking lots to reduce the need for new construction and costly land acquisitions.
- Examine the potential for extensive transit service to these locations during peak travel periods.
- Increase the visibility and promote existing and future lots with improved signage and informational promotions.
- Develop strategies to implement park-and-ride lots that will have little or no cost to users.
- Implement policies that require park-and-ride lots to include bicycle parking and provide access for transportation modes such as buses, bicycles and pedestrians.

Efforts are currently underway to implement park-and-ride lots in the town of Hadley and the city of Northampton along Route 9 in the vicinity of I-91. Transit service will be provided as well as bicycle parking. The proposal will serve as a model from which future lots will be developed and implemented.

COMMUNITY - Chicopee

PARK AND RIDE LOT LOCATION - Route 33 (Memorial Drive at the Fairfield Mall)

LOT DESCRIPTION - This parking lot utilizes the customer parking spaces for the Fairfield Mall. The parking area is well maintained by the Fairfield Mall. This lot is also in close proximity to the Massachusetts Turnpike Exit 5.

NUMBER OF PARKING SPACES - This lot utilizes customer parking areas, therefore no set number of parking spaces have been allocated for Park and Ride use.

LOT CONDITION - The Fairfield Mall parking lot is paved and all parking spaces are clearly marked with painted lines. The parking lot is also well lit during the evening hours.

REPORTED SAFETY PROBLEMS - There are no major reports of safety problems at this location.

SERVICES AVAILABLE - PVTA Bus service, retail shopping at the Fairfield Mall

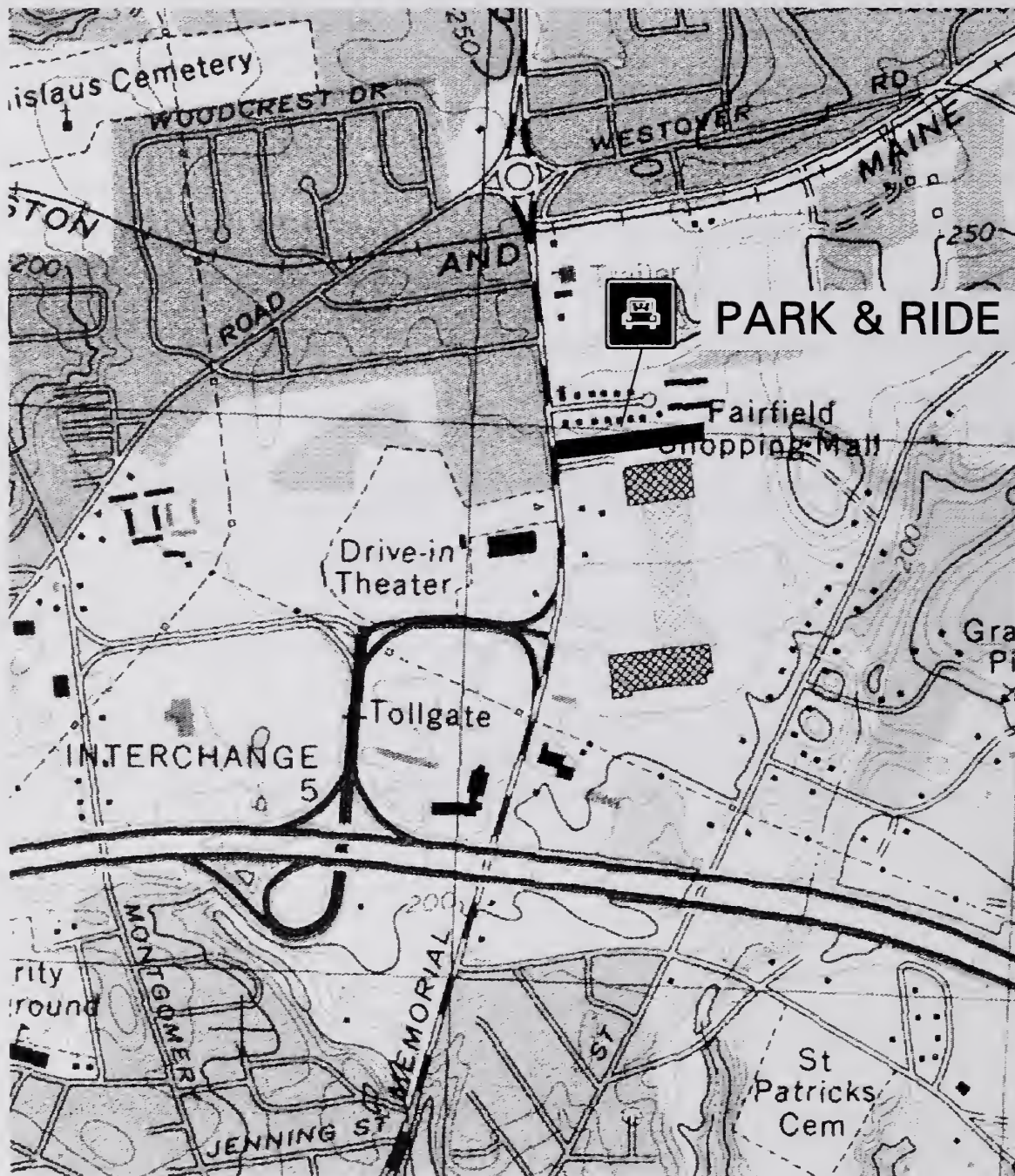
PARKING COST - Free

AGREEMENT STATUS - This lot is an old MHD Park and Ride lot. A small MHD Park and Ride lot sign still exists for this location. No formal agreement exists for this lot.

PVPC RECOMMENDATION - A new parking agreement should be developed between the Fairfield Mall and the Massachusetts Highway Department. The PVPC will initiate discussions to finalize a formal agreement.

Chicopee, MA

FAIRFIELD MALL PARK & RIDE LOT



PARK & RIDE LOT

SCALE 1 in. = 1000 ft.

Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

Prepared by:



Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

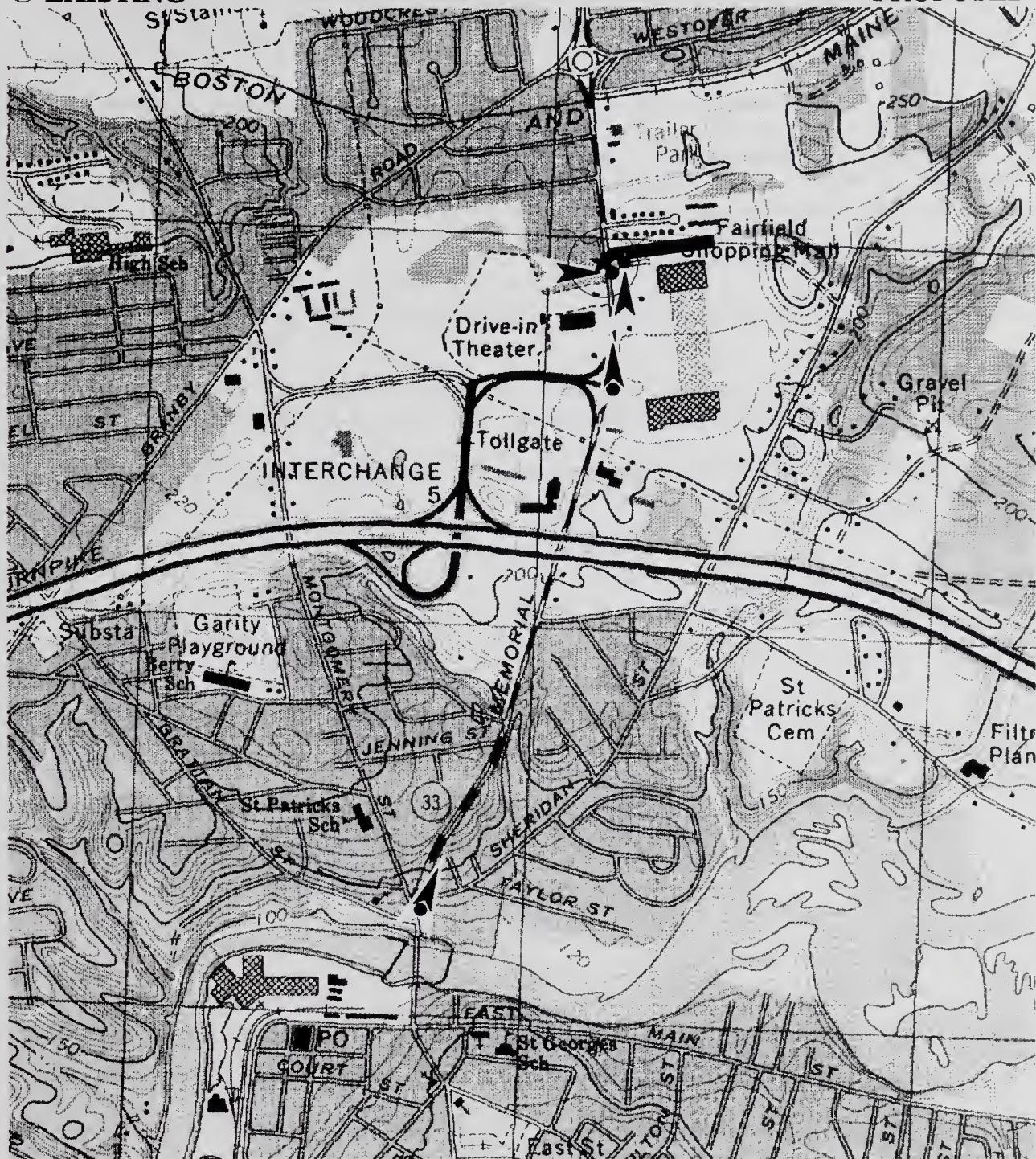
April 1997.



Chicopee, MA SIGN LOCATIONS FAIRFIELD MALL PARK & RIDE LOT

⊙ EXISTING

● PROPOSED



SCALE 1 in. = .25 mi.

Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

Prepared by:



Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.



COMMUNITY - Hadley**PARK AND RIDE LOT LOCATION - Route 9 (Mountain Farms Mall) - Proposed**

LOT DESCRIPTION - This lot has been proposed under the 1998 Transportation Demand Management program. It is proposed to utilize the existing customer parking areas for the Mountain Farms Mall on Route 9.

NUMBER OF PARKING SPACES - This lot is proposed to utilize customer parking areas, therefore no set number of parking spaces have been allocated for Park and Ride use

LOT CONDITION - The Mountain Farms Mall parking lot is paved and all parking spaces are clearly marked with painted lines. The parking lot is also well lit during the evening hours.

REPORTED SAFETY PROBLEMS - Not studied

SERVICES AVAILABLE - PVTA Bus service, retail shopping at the Mountain Farms Mall

PARKING COST - Free

AGREEMENT STATUS - There is no current agreement for this lot.

PVPC RECOMMENDATION - Pending approval of PVPC's TDM application, a formal agreement will be sought between the MHD and the Mountain Farms Mall.

COMMUNITY - Ludlow

PARK AND RIDE LOT LOCATION - Route 21 (Center Street) in the Rear of the McDonald's

LOT DESCRIPTION - This location is a Massachusetts Turnpike Authority park and Ride lot. The parking area is located behind a McDonald's restaurant in a separate parking area. This lot operates in close proximity to Exit 7 of the Massachusetts Turnpike.

NUMBER OF PARKING SPACES - 43

LOT CONDITION - This parking area is paved and all parking spaces are clearly marked with painted lines. The parking lot is enclosed by a chain link fence on three sides.

REPORTED SAFETY PROBLEMS - No

SERVICES AVAILABLE - McDonald's restaurant, bicycle racks.

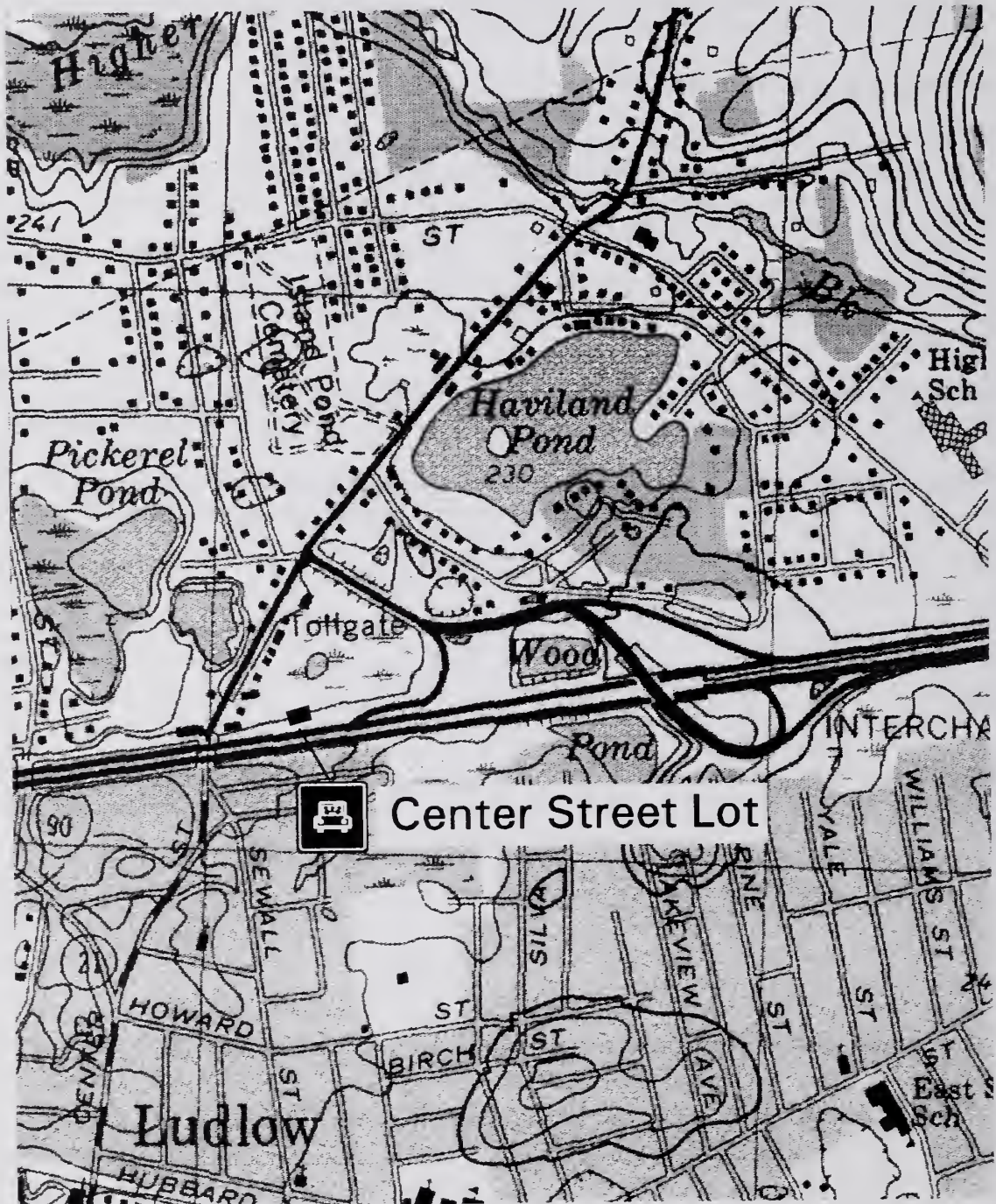
PARKING COST - Free

AGREEMENT STATUS - It is assumed that a formal agreement exists between the Massachusetts Turnpike Authority and McDonald's.

PVPC RECOMMENDATION - Continue to monitoring this parking lot.

Ludlow, MA

MASS. TURNPIKE PARK & RIDE LOT



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

SCALE 1 in. = 1000 ft.

Prepared by:



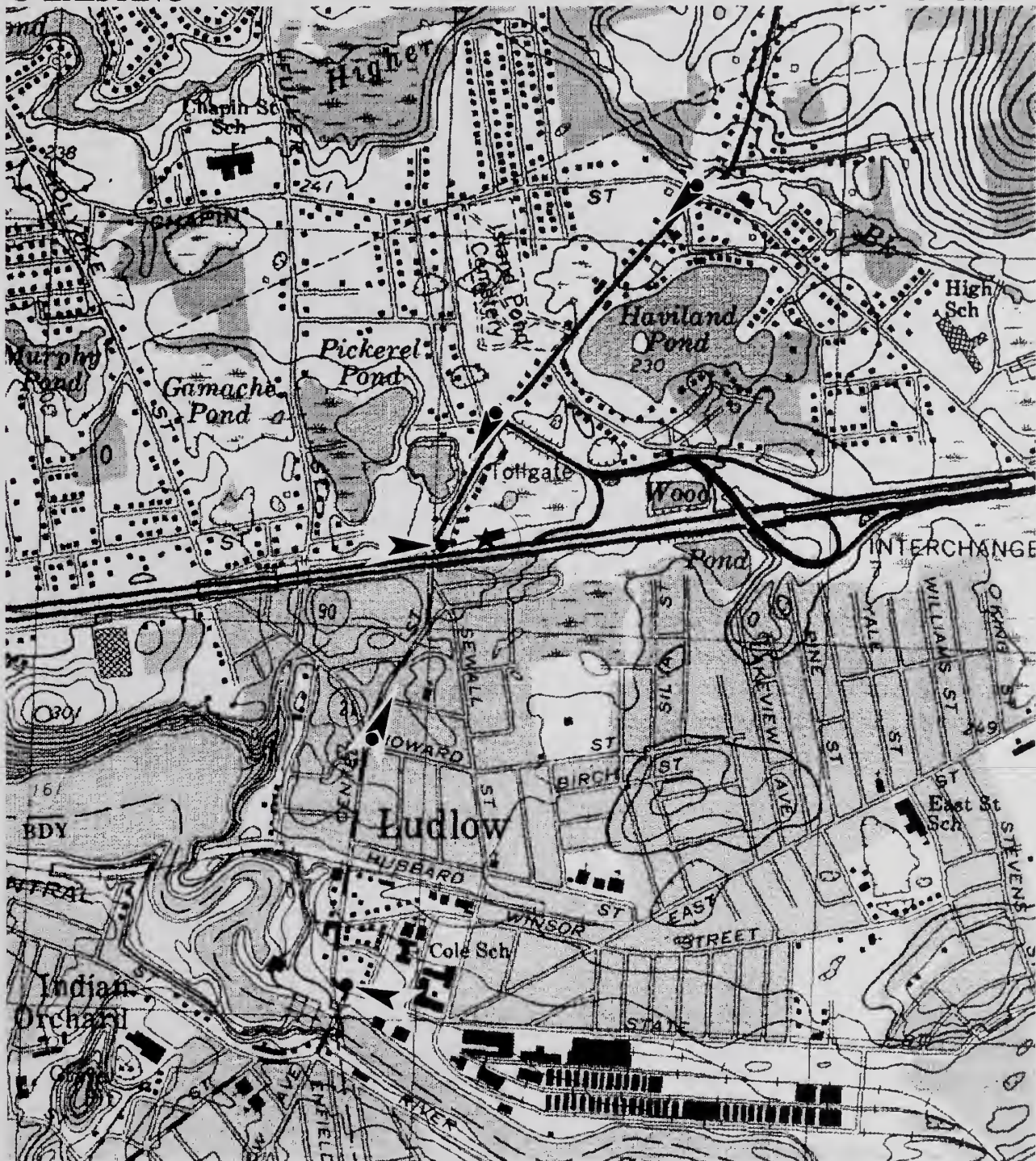
Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.

Ludlow, MA SIGN LOCATIONS MASS. TURNPIKE PARK & RIDE LOT

⊙ EXISTING

● PROPOSED



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

SCALE 1 in. = .25 mi.

Prepared by:



Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.



COMMUNITY - Northampton

PARK AND RIDE LOT LOCATION - Route 9 (at Sheldon Field) - Proposed

LOT DESCRIPTION - This Park and Ride lot was recently approved for funding under the TDM program. It is proposed to be located at Sheldon Field off of Route 9 approximately one half mile west of I-91.

NUMBER OF PARKING SPACES - 81

LOT CONDITION - This lot is proposed to be paved with parking spaces defined by painted lines.

REPORTED SAFETY PROBLEMS - N/A

SERVICES AVAILABLE - PVTA bus service, bicycle storage facilities

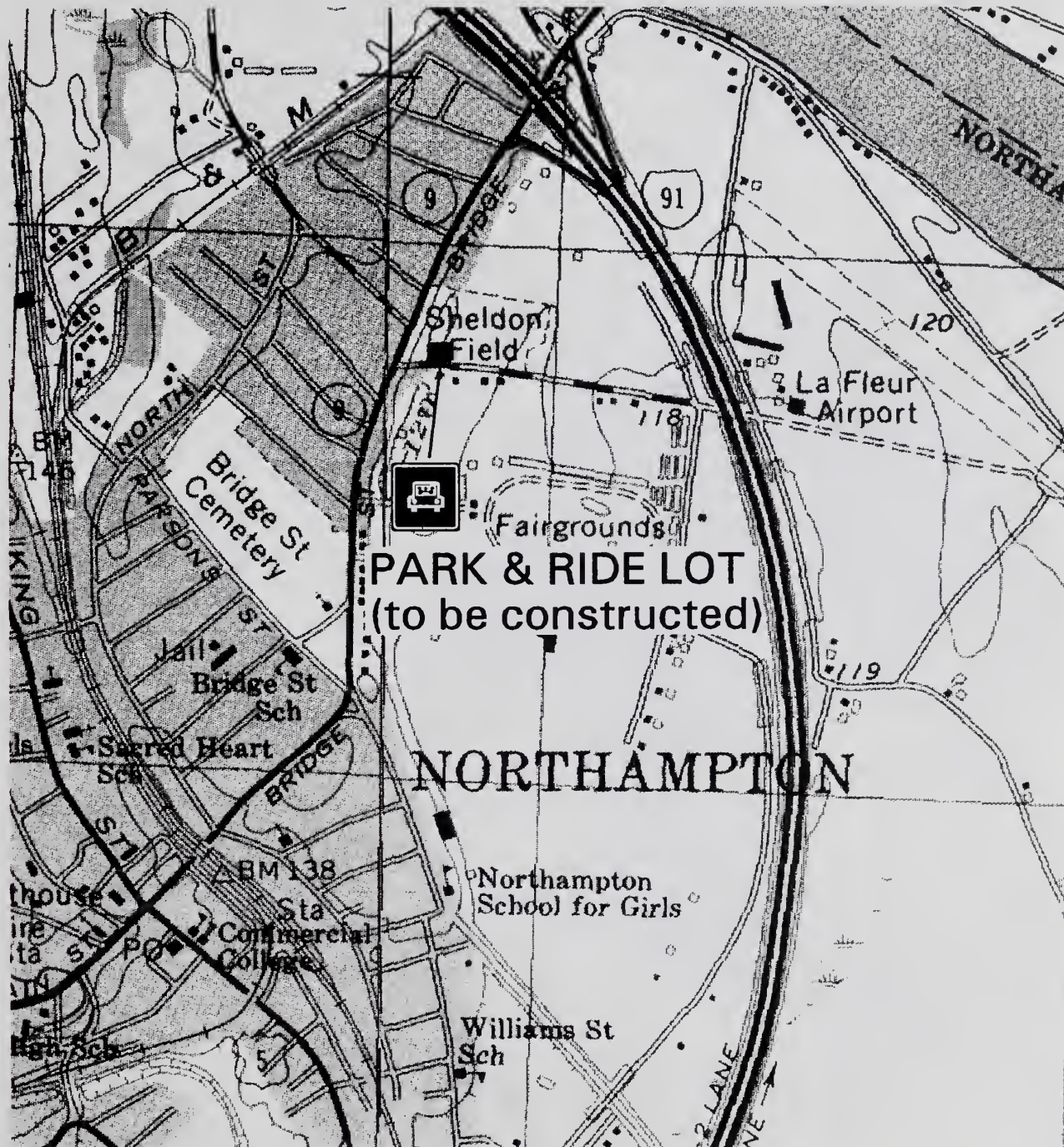
PARKING COST - Free

AGREEMENT STATUS - There is no formal agreement to date for this parking lot.

PVPC RECOMMENDATION - Upon construction of this parking lot, a formal agreement will be sought between the MHD and the city of Northampton.

Northampton, MA

MUNICIPAL PARK & RIDE LOT



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.



SCALE 1 in. = 1000 ft.

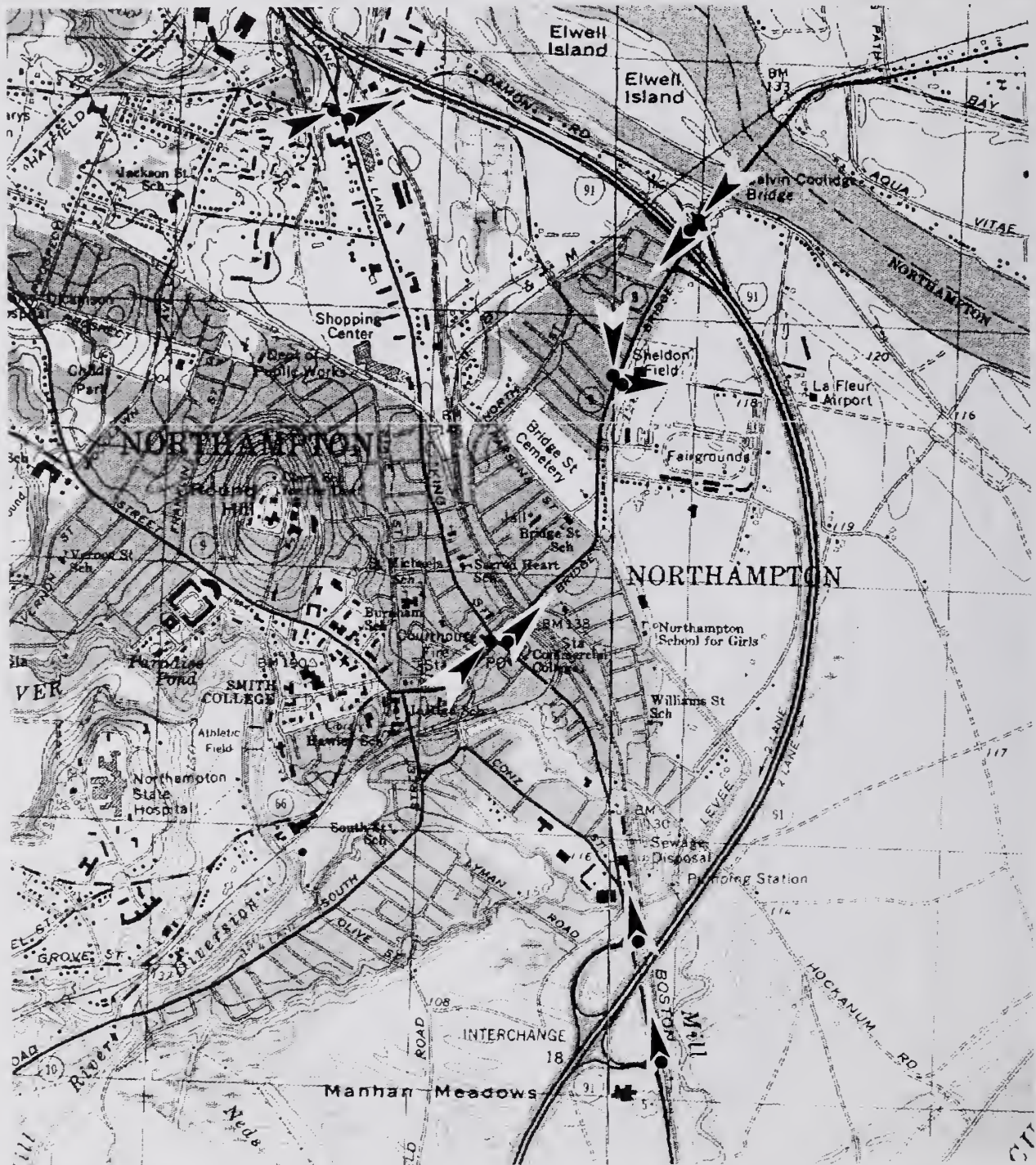
Prepared by:

Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.

Northampton, MA SIGN LOCATIONS MUNICIPAL PARK & RIDE LOT

• PROPOSED



SCALE 1 in. = 2000 ft.

Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

Prepared by:



Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.



COMMUNITY - Palmer

PARK AND RIDE LOT LOCATION - Route 32 (Thorndike Street) in the Rear of the McDonald's

LOT DESCRIPTION - This location is a Massachusetts Turnpike Authority park and Ride lot. The parking area is located behind a McDonald's restaurant in a separate parking area. This lot operates in close proximity to Exit 8 of the Massachusetts Turnpike.

NUMBER OF PARKING SPACES - 34

LOT CONDITION - This parking area is paved and all parking spaces are clearly marked with painted lines. The parking lot is enclosed by a chain link fence on three sides.

REPORTED SAFETY PROBLEMS - No

SERVICES AVAILABLE - McDonald's restaurant, bicycle racks.

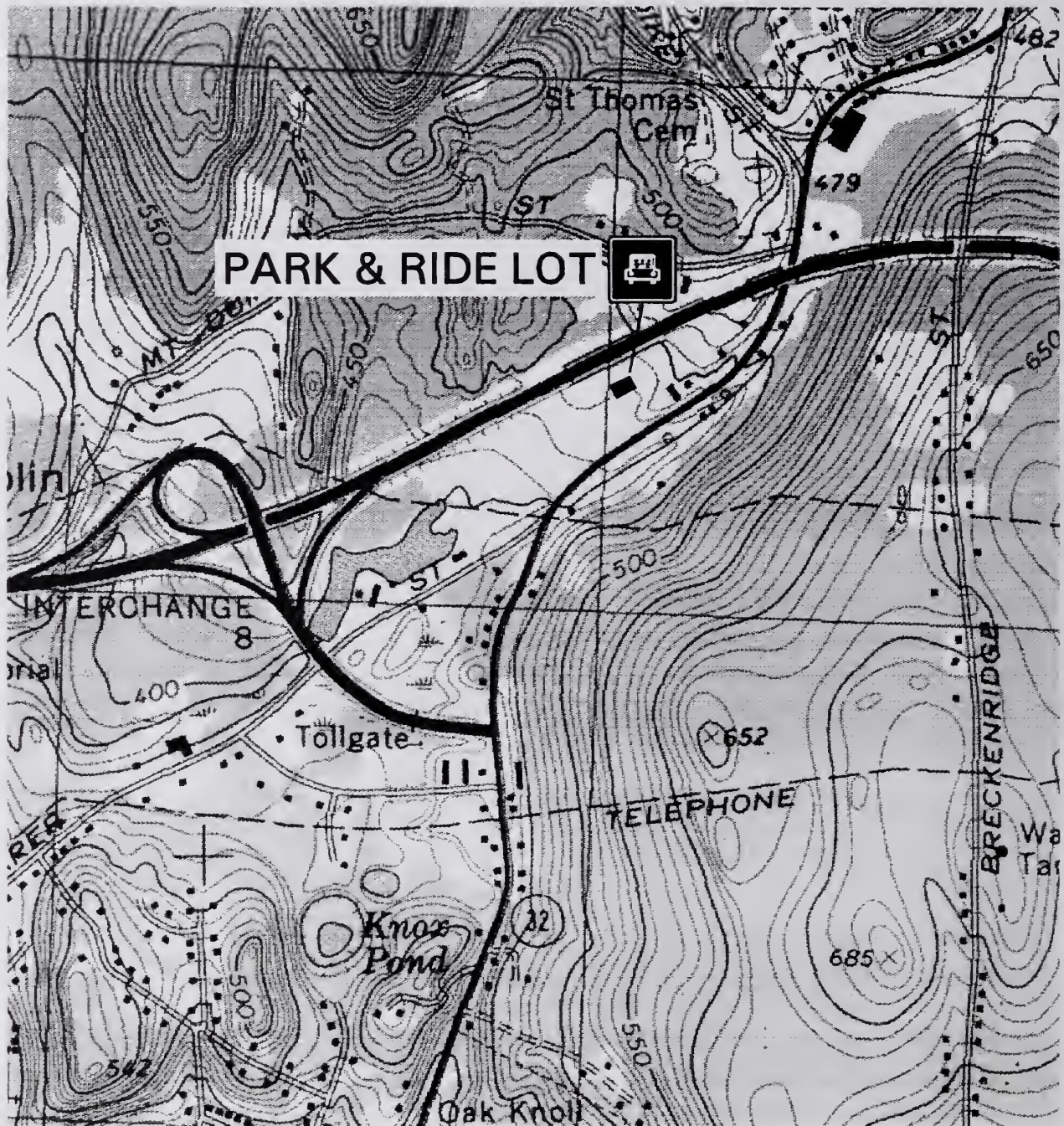
PARKING COST - Free

AGREEMENT STATUS - It is assumed that a formal agreement exists between the Massachusetts Turnpike Authority and McDonald's.

PVPC RECOMMENDATION - Continue to monitoring this parking lot.

Palmer, MA

MASS. TURNPIKE PARK & RIDE LOT



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

SCALE 1 in. = 1000 ft.

Prepared by:



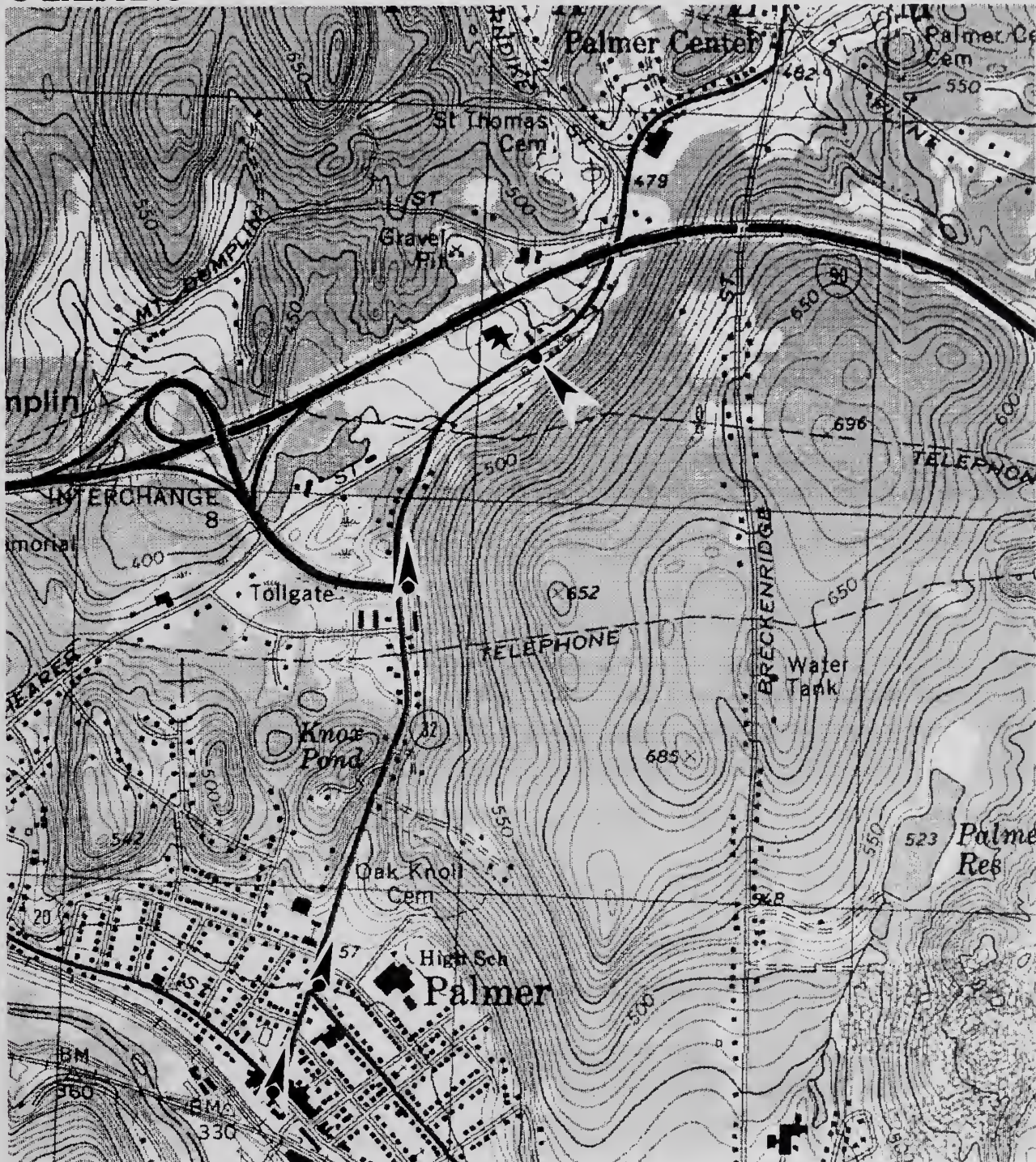
Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.

Palmer, MA SIGN LOCATIONS MASS. TURNPIKE PARK & RIDE LOT

⊙ EXISTING

● PROPOSED



SCALE 1 in. = .25 mi.

Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

Prepared by:



Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.



COMMUNITY - Springfield

PARK AND RIDE LOT LOCATION - Alan and Cooley Street (Caldor Shopping Center)

LOT DESCRIPTION - This location is a PVRTA Park and Ride lot which utilizes customer parking areas in the Caldor Shopping Plaza. It is directly served by the PVRTA which provides access to downtown Springfield.

NUMBER OF PARKING SPACES - This lot utilizes customer parking areas, therefore no set number of parking spaces have been allocated for Park and Ride use.

LOT CONDITION - This parking lot is paved and all parking spaces are clearly marked with painted lines.

REPORTED SAFETY PROBLEMS - No

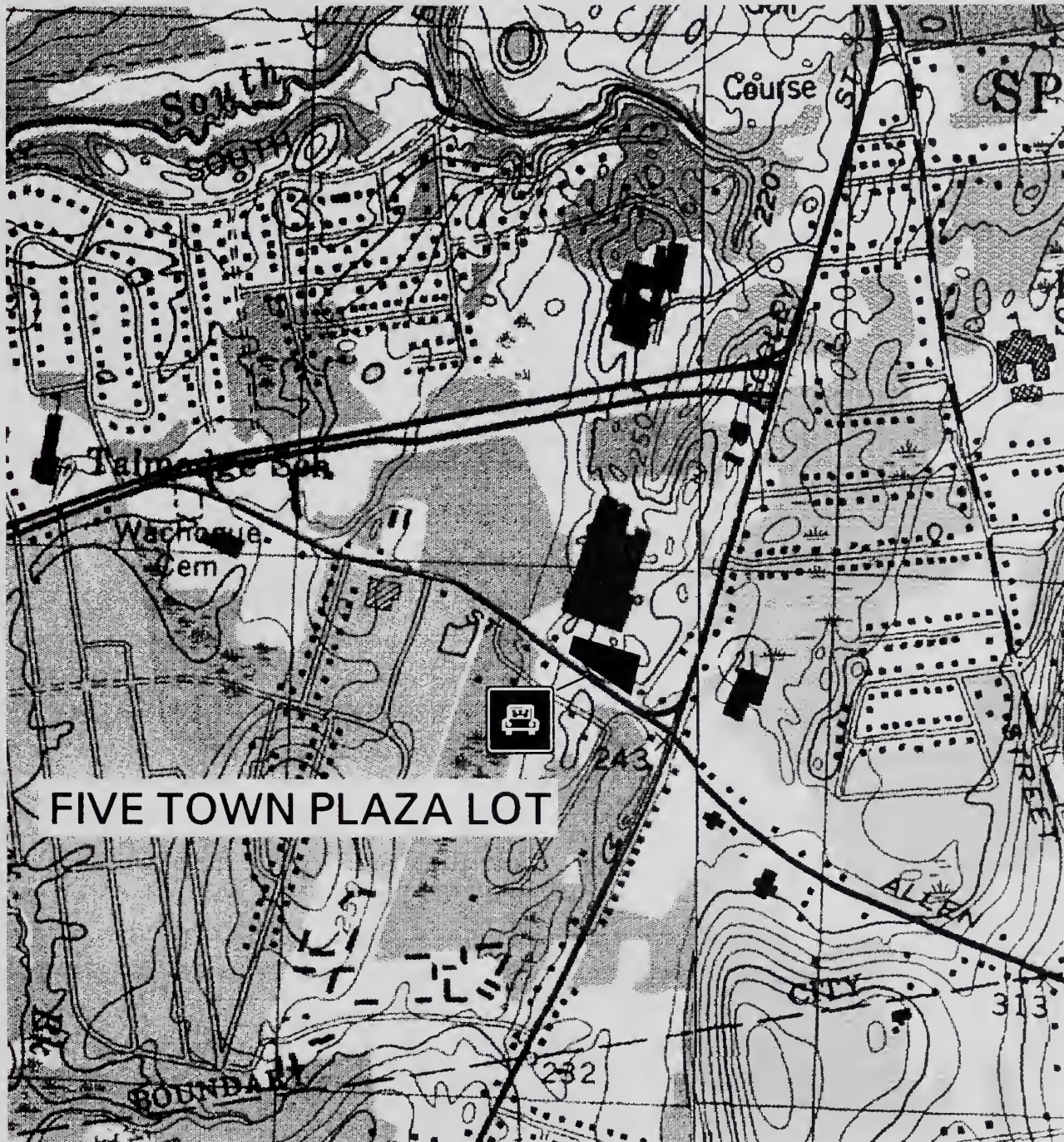
SERVICES AVAILABLE - PVRTA bus service, retail shopping

PARKING COST - Free

AGREEMENT STATUS - It is assumed that a formal agreement exists between the PVRTA and the owner of this shopping plaza. The PVPC will check on the agreement status for this Park and Ride lot.

PVPC RECOMMENDATION - Continue to monitor this Park and Ride lot.

Springfield, MA
PVTA PARK & RIDE LOT



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.



SCALE 1 in. = 1000 ft.

Prepared by:

Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.

Springfield, MA SIGN LOCATIONS PVTA PARK & RIDE LOT

⊙ EXISTING

● PROPOSED



SCALE 1 in. = .25 mi.



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

Prepared by:



Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.

COMMUNITY - Springfield

PARK AND RIDE LOT LOCATION - 10 Centre Parking Lot - Main Street under I-291

LOT DESCRIPTION - This parking area is a private parking area off of Main Street in close proximity to I-91 and I-291. This parking lot is less than one half mile from downtown Springfield.

NUMBER OF PARKING SPACES - This lot utilizes customer parking areas, therefore no set number of parking spaces have been allocated for Park and Ride use.

LOT CONDITION - This parking lot is paved and all parking spaces are clearly marked with painted lines. This parking area is enclosed by a chain link fence.

REPORTED SAFETY PROBLEMS - No

SERVICES AVAILABLE - PVTA bus service

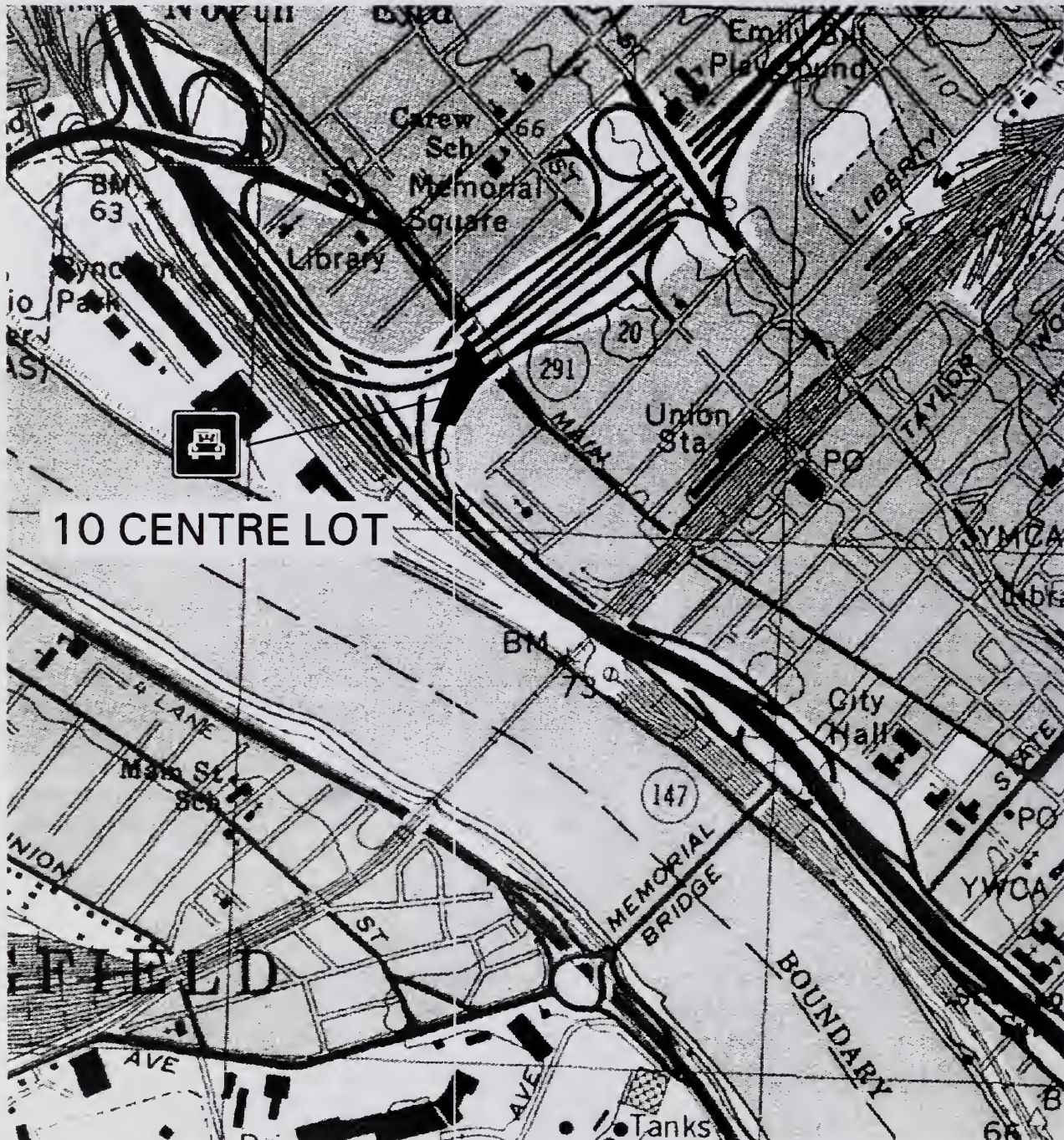
PARKING COST - A minimal cost exists for vehicles using the PVTA bus service. Hourly rates apply to all other vehicles.

AGREEMENT STATUS - It is assumed that a formal agreement exists between the PVTA and the owner of this shopping plaza. The PVPC will check on the agreement status for this Park and Ride lot.

PVPC RECOMMENDATION - Continue to monitor this Park and Ride lot.

Springfield, MA

PVTA PARK & RIDE LOT



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

SCALE 1 in. = 1000 ft.

Prepared by:



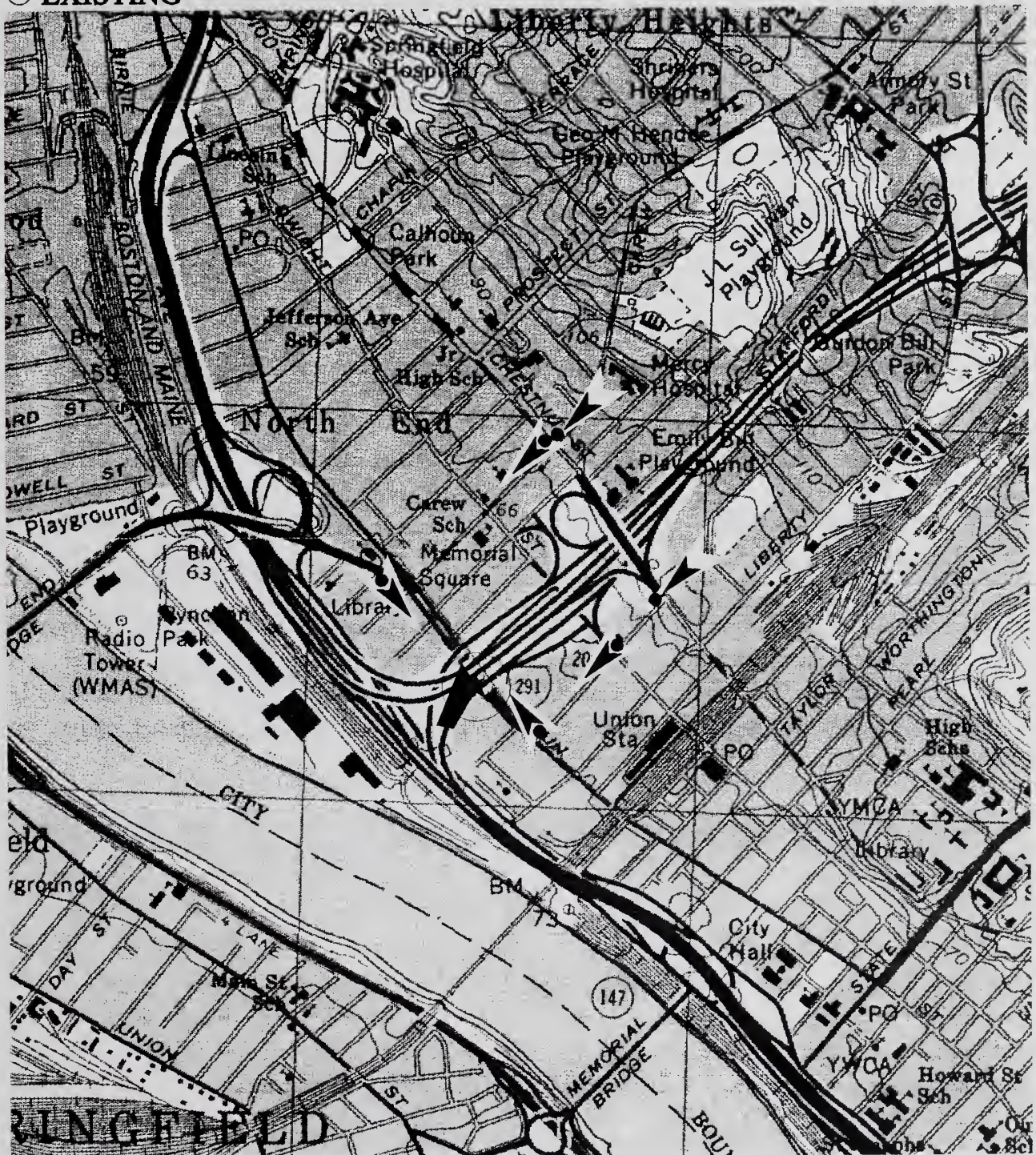
Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.

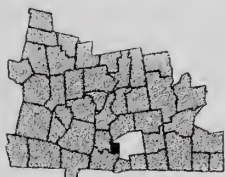
Springfield, MA SIGN LOCATIONS PVTA PARK & RIDE LOT

⊙ EXISTING

● PROPOSED



SCALE 1 in. = .25 mi.



Notes:

Park & Ride lot and existing sign locations located using Global Positioning Systems (GPS) with accuracies within 2-5 meters after differential correction. Proposed sign locations were manually digitized with general coordinates. Basemap images from MASSGIS digital USGS quads, NAD83 meters.

Prepared by:



Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

April 1997.

COMMUNITY - Westfield

PARK AND RIDE LOT LOCATION - Route 10/202

LOT DESCRIPTION - No information was available on this former MHD Park and Ride lot.

NUMBER OF PARKING SPACES - N/A

LOT CONDITION - N/A

REPORTED SAFETY PROBLEMS - N/A

SERVICES AVAILABLE - N/A

PARKING COST - N/A

AGREEMENT STATUS - N/A

PVPC RECOMMENDATION - It is recommended that this location be abandoned at this time.

Public Participation and Strategy Development

Public participation for the Pioneer Valley CMS is conducted through the region's Joint Transportation Committee (JTC). The JTC is kept involved in the CMS through status updates at general meetings, review and comment on progress reports, survey information for the Regional Transportation Plan and community meetings for strategy development. A copy of CMS public participation support information is included in the appendix. The PVPC staff has just initiated the next phase of public participation geared toward strategy development. This includes meeting individually with each community in which congestion problems were verified to present initial findings and further develop congestion relief strategies. The PVPC staff arranges this meeting through the community's JTC member. Local elected officials, representatives from the community's engineering and planning department and the Massachusetts Highway Department District 2 office are invited to discuss congestion relief strategies for identified problem areas.

The PVPC has met with each of the affected communities and incorporated all comments into this report. All findings have been used as the source for congestion relief material in the 1997 update to the Regional Transportation Plan. The PVPC staff will continue meeting with communities with verified congestion problems on a regular basis. As information is gathered it will be incorporated into the CMS.

As part of the public participation process a number of additional locations were identified for verification of congestion. These locations are presented in Table 8.

Table 8
Additional Locations to be Studied

Community	Corridor	From	To
Amherst	North Pleasant St.	Pomeroy Ln.	Cowls Rd.
Amherst/Hadley	Massachusetts Ave.	N. Maple St.	N. Pleasant St.
Belchertown	Federal St./N. Main St./S. Main St.	Bay Rd.	Mill Valley Rd.
Chicopee	Memorial Dr./Broadway St.	Montgomery St.	St. James Ave.
Chicopee	Grattan/McKinstry/Granby	I-391	Memorial Dr.
Hadley	Bay Rd.	Lawrence Plain Rd.	Route 9
Holyoke	Easthampton Rd.	Southampton Rd.	I-91 ramps
Holyoke	Route 5	Anderson Hill Rd.	River Terrace
Holyoke	Beech St.	W. Franklin St.	Mueller Bridge
Holyoke	South St.	I-391	Route 5
Longmeadow	Route 5	Williams St.	Connecticut S.L.
Ludlow	Center St.	Rood St.	Holyoke St.
West Springfield	Dewey/Pease/Morgan/Bernie	Prospect St.	Route 20
Wilbraham	Route 20 (Boston Road)	Maynard Rd.	Stony Hill Rd.



Appendix C
Pioneer Valley Region Land Use Plan



Why Do We Need A Regional Land Use Plan?

As the Pioneer Valley approaches the year 2000, it is faced with significant growth-related challenges and problems, including:

- uncontrolled sprawl, or dispersed growth patterns, which degrades community character, quality of life and the environment;
- declining urban centers, with a concentration of poverty, crime, disinvestment and urban problems in the region's core cities;
- air quality which is among the worst in the nation, worsened by a steady increase in vehicle trips and miles traveled;
- environmental impacts of growth on the region's rivers, lakes, water supplies, wetlands, forests, wildlife and open space;
- fragmented, locally-determined land use decisionmaking, which contributes to urban sprawl;
- inequitable distribution of the tax revenues and public investment;
- the incremental loss of farmlands and the region's agricultural heritage;
- changes in family size and type, and an aging population which require new forms of housing.

The Regional Land Use Plan for the Pioneer Valley has not been updated since 1978. Federal laws, including the Clean Air Act and the Intermodal Surface Transportation Efficiency Act (or ISTEA), require the region to develop regionally-coordinated plans for land use and an efficient intermodal transportation system.

With these challenges, however, come important new opportunities. Across the United States and this region, there has been an increasing trend toward regional cooperation and problem-solving. New technologies, such as Geographic Information Systems (GIS), allow planners to create sophisticated computerized maps to analyze land characteristics.

Together, the 1996 Regional Land Use Plan and Growth Policies are intended to provide meaningful guidance to the communities of the Pioneer Valley in developing regionally-consistent local master plans and zoning bylaws, and in making other land use or growth decisions. They are accompanied by an implementation strategy which provides communities with detailed guidance on how to put this plan into action.

A Vision for the Valley

The overall vision of the Pioneer Valley in the 21st century is to promote diverse, economically and environmentally healthy communities framed by greenbelts of open space and connected by a high-quality intermodal transportation system.

Key components of this vision include:

- communities integrate housing, shops, offices, schools, parks and civic facilities into compact areas, to make it easier to walk, bicycle and use transit;
- sprawling growth is minimized and replaced by alternative development patterns, including revitalized mixed-use urban centers, as well as traditional neighborhood developments and satellite growth centers in suburban/rural areas;
- the regional transportation system provides a variety of interconnected options, including roads, transit, pedestrian and bicycle paths, which link all destinations, ensuring effective mobility for people and goods.
- the substantial majority of housing and employment is targeted to urban growth areas, so services can be provided efficiently;
- natural resources and environmental quality are conserved and improved;
- cities and towns are made more livable by re-greening them with ample open space, squares, greens and parks, and improved access to cleaner waterways;
- urbanized areas are enclosed by well-defined greenbelts of farmland, forestland, or wildlife corridors which are permanently protected;
- rural character is preserved by supporting farming and forestry, clustered or village-centered housing, and traditional town centers;
- housing options are available for citizens of diverse ages and economic means; and

- communities strive for a balance of jobs and housing, which helps to reduce the need for long commutes to work.

The Process of Preparing the Regional Land Use Plan

Four steps constituted the process of preparing the Regional Land Use Plan.

1. Regional Goals and Objectives

An Advisory Committee of planners and community officials from the region was convened to advise the Planning Commission on preparation of the Regional Goals and Objectives and on the choice of a preferred build-out scenario.

2. Regional Build-out Scenarios

Projections were made for the amount of additional land likely to be developed by the year 2020. Three alternative build-out scenarios were developed showing possible ways this additional developed acreage could be distributed over the region. These three scenarios were:

- a) dispersed development, in which growth continues as it does now, with sprawling residential and commercial development;
- b) compact growth, in which one-third of the projected growth is assumed to be four times as densely built as in the dispersed scenario; and
- c) satellite growth centers, in which two-thirds of the projected growth is assumed to be four times as densely built as in the dispersed scenario, and half of that dense development is allocated to fourteen growth centers in the region.

3. Land Suitability Analysis

All land in the Pioneer Valley was evaluated to determine its suitability for development, based on land characteristics such as environmental constraints, carrying capacity, existing uses, use restrictions, public infrastructure, and proximity to urban centers. A GIS-based Regional Land Use Suitability Map was produced.

4. Regional Land Use Plan

After the committee chose the satellite growth center scenario as their preferred alternative, the Regional Land Use Plan was developed, using Geographic Information Systems technology. It illustrates the recommended locations across the region of ten categories of land use:

- land suitable for satellite growth centers, with mixed residential and commercial uses
- land suitable for compact development for all uses
- land suitable for urban economic investment areas
- land suitable for protected open space
- sensitive natural areas, suitable for low density residential uses with appropriate controls
- land suitable for low density commercial and industrial uses
- land suitable for low density residential uses

Regional Goals and Objectives

Land Use Planning

Goal: Community zoning bylaws and land use decisions are consistent with community and regional master plans.

Objectives: Adopt regionally-consistent master plans.
 Develop local zoning and growth management controls consistent with regional goals.
 Reflect municipal goals in regional plans.
 Develop a regional process for land use decisionmaking.

Growth Impacts and Community Character

Goal: New development is designed to enhance community character, maximize quality of life, support a diversified economy and minimize negative impacts.

Objectives: Discourage urban sprawl.
 Protect community character.
 Share regional benefits and burdens.
 Promote a balance of jobs and housing.

Revitalization of City and Town Centers

Goal: City and town centers are the vibrant focus of community life and commerce.

Objectives: Revitalize urban core areas.
 Revitalize town and village centers.
 Facilitate urban redevelopment.
 Promote transit-oriented developments.
 Encourage mixed uses.
 Locate new public institutions and services in urban or town centers.
 Redevelop vacant and underutilized urban areas.
 Promote adaptive re-use of historic buildings.
 Direct rural growth in rural areas to existing town centers.

Residential Development

Goal: Compact residential development, in pedestrian-oriented neighborhoods of diverse housing types, near employment or community centers.

Objectives: Encourage traditional neighborhood developments.
 Promote a diversity of housing types.
 Balance urban development with creation of parkland and open space.

Commercial and Industrial Development

Goal: Existing commercial and industrial centers are revitalized.

Objectives: Minimize commercial strip development.
 Redevelop vacant or underutilized industrial areas.
 Retrofit low-density commercial areas.
 Promote strong central business districts.
 Promote attractive commercial and industrial development consistent with community character.
 Direct new high-density development to major transportation intersections.
 Encourage development that mixes commercial and residential uses.
 Promote employment centers served by transit.

Environmental Quality

Goal: Our region's key environmental assets are protected, restored and enhanced.

Objectives: Adopt regionally-consistent land use controls.
Create a regional system of greenbelts, protected open space and recreational areas.
Provide urban recreational areas and greenways, particularly along waterfronts.
Improve air quality.
Protect water resources.
Protect prime agricultural land.

Transportation

Goal: A coordinated, multi-modal, economically- and environmentally-sound transportation system moves people and goods safely, dependably and efficiently.

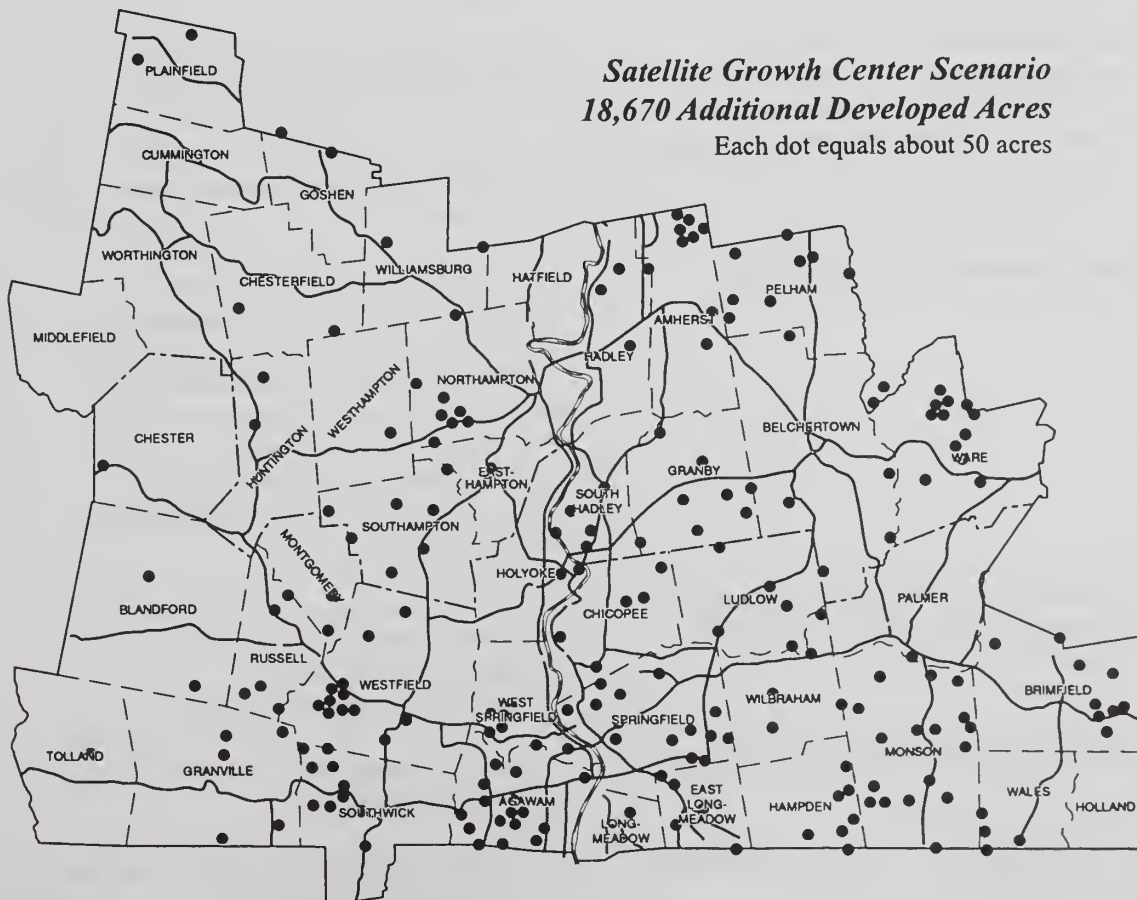
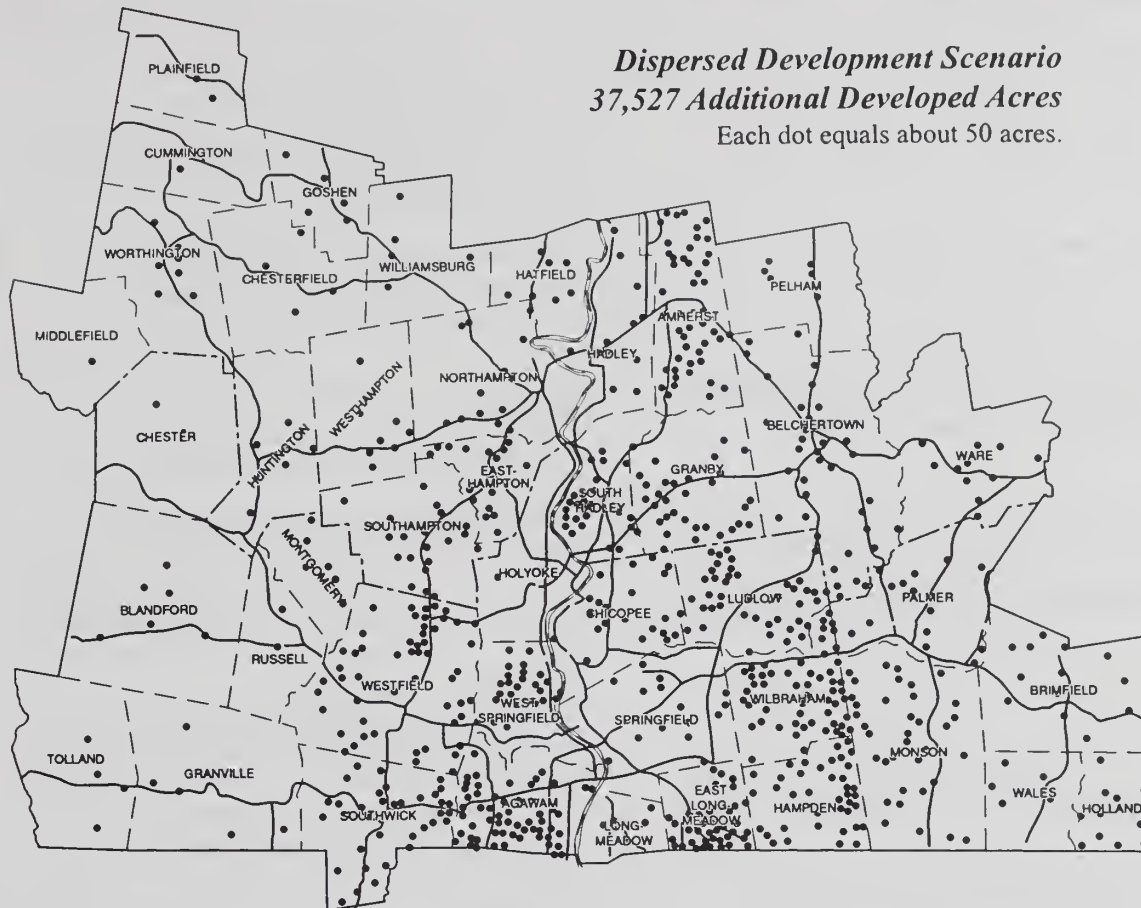
Objectives: Develop a regional network of bicycle and pedestrian trails.
Integrate pedestrian, bicycle and transit access into new and existing developments.
Encourage travel alternatives to the single-occupancy vehicle.
Minimize new highway construction and keep the existing roadways well-maintained.
Promote road and bridge design consistent with community character.

Infrastructure

Goal: Safe, reliable and high quality infrastructure is provided.

Objectives: Direct new development to areas served by infrastructure.
Confine infrastructure expansion to carefully-planned growth areas.

Alternative Regional Build-Out Scenarios



Regional Land Use Plan: Composition of GIS Mapping Data Layers

Land Use Category	Data Layers in Composition (Source)
1) Open Water	<ul style="list-style-type: none"> • Water bodies (1985 UMass/MacConnell) • Hydrology (MassGIS)
2) Existing Developed Land	<ul style="list-style-type: none"> • Land use, including residential, commercial, industrial, transportation, waste disposal (1985 UMass/MacConnell)
3) Existing Outdoor Recreation and Open Space	<ul style="list-style-type: none"> • Agricultural Preservation Restrictions (MassGIS) • Municipal, state, federally-owned land (MassGIS) • Public and private outdoor recreation areas (MassGIS)
4) Land Suitable for Protected Open Space	<ul style="list-style-type: none"> • Watersheds for public water supply reservoirs (DEP) • 100-year floodplains (FEMA) • Aquifer Protection Overlay Zones (DEP) • Zone II wellhead protection areas for public wells (DEP) • Interim wellhead protection areas (DEP) • Wetlands and 100-foot buffer around wetlands • Steep slopes over 15%
5) Land Suitable for Urban Economic Investment Area	<ul style="list-style-type: none"> • Economic opportunity areas (PVPC) • Vacant land in industrial parks (PVPC)
6) Land Suitable for Satellite Growth Center	<ul style="list-style-type: none"> • Undeveloped, unprotected, unconstrained land within 3/4 mile of selected major highway intersections
7) Land Suitable for Compact Growth	<ul style="list-style-type: none"> • For communities over 9000 population, undeveloped, unprotected, unconstrained land within a buffer of at least 3 of the following: radius of water line; sewer line; transit line; major employer; census designated place; or interstate highway interchange. • For communities under 9000 population, undeveloped, unprotected, unconstrained land within buffer of town center.
8) Environmentally Sensitive Areas, Suitable for Low Density Residential Uses with Appropriate Controls	<ul style="list-style-type: none"> • Lands not included in categories 1-7, which are • Active farms (UMass/MacConnell, 1985) • Rare species priority habitats • 200-buffer around other water bodies
9) Land Suitable for Low Density Commercial	<ul style="list-style-type: none"> • Lands zoned commercial or industrial, and not included in categories 1-8
10) Land Suitable for Low Density Residential	<ul style="list-style-type: none"> • Lands zoned residential or agricultural, and not included in categories 1-8

Innovative Strategies for Implementation

The Regional Land Use Plan includes strategies for implementing its recommendations on a local level. The following are several key strategies which will achieve multiple objectives of the plan. These strategies should be adopted, where applicable, by the communities in our region.

- Encourage **compact development** through zoning. Provide incentives for urban infill, clustered residential and mixed use villages within or immediately surrounding growth centers in order to increase pedestrian/bicycle access, jobs and affordable housing.
- Encourage **Transit-Oriented Development (TOD)**. Rezone areas along transit lines to allow for TODs which are concentrations of moderate and high density housing, civic facilities, and mixed use business establishments. Provide incentives to developers for installing pedestrian amenities such as bus shelters or benches.
- Allow **Traditional Neighborhood Development (TND)**. Change zoning to allow TNDs which have grid-like street patterns with sidewalks and street trees, medium to high-density housing, and are walking distance to shops and services.
- Establish **public-private partnerships** for commercial improvements. Work to restore existing downtowns or to retrofit dilapidated strip malls through Economic Target Areas, Business Improvement Districts, and Main Street programs.
- **Limit infrastructure** expansions. Create a master plan depicting future infrastructure expansions based on a planned growth scheme.
- Promote **mixed use developments**. Change zoning to allow mixed uses in downtowns, old industrial buildings, and single use commercial districts.
- Establish **greenbelts** or blueways. Create protected open spaces along rivers, abandoned rail lines and other linear features to contain urban growth. Provide recreational opportunities and wildlife migration corridors while protecting natural features.
- Redevelop **brownfields**. Identify and prioritize potentially developable abandoned and contaminated sites within each community. Provide incentives to redevelopment through public-private partnerships and tax benefits.
- Control **commercial strip development**. Establish limited access highways with service complexes and self-contained business or industrial parks. Change zoning to restrict commercial strips and allow planned business developments. Create highway business zones with performance standards.
- Increase **pedestrian, bicycle and transit** activity. Require new developments to include circulation plans for pedestrians, bicycles and transit. Improve bus stops and other transit amenities.

The New Urbanism: Traditional Neighborhood Developments

After decades of sprawling suburban subdivisions, planners are beginning to realize the advantages of the traditional neighborhoods built before World War II. These older neighborhoods and towns have design characteristics which foster a sense of safety and community. New developments built to these traditional standards (summarized below) recreate traditional communities and prove to be very desirable places to live.

Village Streets

- A gridded street pattern replaces isolated developments, with many cul-de-sacs and broad, fast connector streets between each subdivision.
- Relatively short and narrow streets, with two ten-foot travel lanes, define public spaces between houses.
- Shade trees are planted between the street and sidewalk at twenty-foot intervals.
- Visitors park on the streets, parallel to the curb.
- Streets have low traffic volume and speed, because the grid pattern allows many paths to a goal and residents can walk or ride bicycles to many destinations.

Residential Areas

- Houses are on small lots of one-quarter acre to one-sixth acre with modest front yard setbacks of 15 to 20 feet. Fences or hedges separate the front yard from the sidewalk. Many houses have front porches.
- Garages or parking is to the rear or along an alley, so that houses put their best face towards the street.
- Houses are predominantly single-family homes, with some row houses, apartments, and granny apartments mixed in.
- The homes are clustered around pretty public spaces, such as town commons, parks and playgrounds. Fifty percent of a neighborhood is open space, including commons and greenbelts abutting many homes.

Retail Areas

- Shopping takes place on intimate Main Streets, with stores lined up along sidewalks and parking to the rear and along the curb.
- Shops have one or two floors of offices or apartments above.
- Storefronts are brick, stone or clapboards, with awnings and discreet signs.
- Both sides of the street have shade trees and street lamps.
- A residential neighborhood has a convenient corner store, to which residents can walk or bicycle.

Transportation

- Walking is encouraged throughout a development by the presence of sidewalks, street trees, slow car traffic, and nearby shopping and recreation.
- Neighborhoods and places of employment are clustered near public transit stops.

Civic Uses

- Town centers are located on a common or square, with several municipal and public buildings fronting on the common, as well as stores and homes.

"The New Urbanism is concerned with both the pieces and the whole. It applies principles of urban design to the region in two ways. First, urbanism—defined by its diversity, pedestrian scale, public space, and structure of bounded neighborhoods—should be applied throughout a metropolitan region regardless of location: in suburbs and new growth areas as well as within the city. And second, the entire region should be 'designed' according to similar urban principles. It should, like a neighborhood, be structured by public space, its circulation system should support the pedestrian, it should be both diverse and hierarchical and it should have discernible edges."

Peter Calthorpe

From: Peter Katz, *The New Urbanism: Toward an Architecture of Community*, 1994

Alternative Procedure for Determining Regional Transportation Emissions-Land Use/Transportation Modeling for the Pioneer Valley

In 1996 the Pioneer Valley Planning Commission began updating its Regional Land Use Plan for the first time since 1978. The following is a description of the methodology and results from a alternative regional transportation model that includes the land use projections made in the draft Regional Land Use Plan. In order to input the projected land use data into the regional transportation model, a method was developed to translate the acreage numbers of the different land uses into socioeconomic data including the number of retail employees, non-retail employees, and dwelling units in each census block group. These three socioeconomic numbers were then input and run in a new 2020 action model to show the influence of land use planning on vehicle miles traveled and projected air quality emissions for the region.

Methodology of Inputing Land Use Projections into the Regional Transportation Model

For land use categories where commercial and industrial development is projected to occur, the following calculations were used to find increases in the number of retail and non-retail employees that would be created:

General Assumption:

- landscaping and other non-building land use requirements per parcel including roads: 30% for all except for new "satellite growth centers" where it is 20%.
- building heights are an average of 1.25 floors in rural areas and 3 floors in urban areas
- surface parking = 3.5 spaces per 1000 ft² floor area for non-retail and 12 spaces per 1000 ft² floor area for retail (satellite growth centers—non-retail = 2 spaces per 1000 ft² retail = 8 spaces per 1000 ft²).
- each parking space = 325 ft²
- average number of employees = 2.75 per 1000 ft² of building floor area for non-retail
= 4.0 per 1000 ft² of building floor area for retail

To find the building size:

- 1) Building area = Building pad + Parking Lot (Building Pad = ft² in thousands)
- 2) Lot Size (ft²) * 0.7 = 1000 * Building Pad + (# of Floors * Building Pad * # parking spaces * 325)
- 3) Building Pad = (0.7 * Lot Size)/(1000 + # of Floors * # parking spaces * 325 ft²)

To find the number of employees:

- Employees (non-retail) = Building Pad * # of Floors * 2.75
- Employees (retail) = Building Pad * # of Floors * 4.0

For each census tract the following assumptions were applied to the number of acres for each of the ten categories of land use:

- 1) New Satellite Growth Center—Residential and Commercial: Total 3365 Acres
 - Assume 80% in urban areas and 60% in rural areas will be developed by the year 2020
 - 60% Residential development: 60% Single Family Houses on .5 acre lots and 40% apartments (Assume 150 unit average with 15 dwelling units per acre)
 - 40% Commercial development: 50% Retail and 50% Non-Retail
 - The Intrazonal Travel Time for these areas in the model was decreased by 50% to increase the number of trips beginning and ending in the same zone.
- 2) New Compact Residential and Commercial Development: Total 10407 Acres
 - Assume 60% in urban areas 40% in rural areas will be developed by the year 2020
 - 80% Residential development: 70% Single Family Houses on .5 acre lots and 30% will be apartments (Assume 120 unit average with 12 dwelling units per acre)
 - 20% Commercial development: 75% Retail and 25% Non-Retail
 - The Intrazonal Travel Time for these areas in the model was decreased by 25% to increase the number of trips beginning and ending in the same zone.
- 3) Urban Economic Investment: Total 1623 Acres
 - Assume 40% will be developed by the year 2020
 - 25% Retail and 75% Non-Retail
 - Buildings will be an average of 2 floors for both urban and rural areas
- 4) New Low Density Commercial and Industrial: Total 2447 Acres
 - Assume 30% in urban areas and 15% in rural areas will be developed by the year 2020
 - 30% Retail and 70% Non-Retail
 - Buildings will be an average of 1.25 floors in both urban and rural areas.
- 5) New Low Density Residential and Agriculture: Total 137002 Acres
 - Assume 60% in urban areas and 30% in rural areas will be developed by the year 2020
 - Urban Residential development: 70% Single Family Houses on 1 acre lots and 30% apartments (Assume 100 unit average with 10 dwelling units per acre)
 - Rural Residential development: 95% Single Family Houses on 3 acre lots and 5% apartments (Assume 50 unit average with 5 dwelling units per acre)
- 6) Environmentally Sensitive Areas/Low Density Residential: Total 38941 Acres
 - Rural-10% Developed by the year 2020—3 acre lot size (single family houses only)
 - Urban-No Development
- 7) Protected Open Space: Total 272980 Acres
 - Rural-10% Developed by the year 2020—3 acre lot size (single family houses only)
 - Urban-No Development
- 8) Existing Development: Total 104077 Acres
 - No Growth—1990 Data holds for 2020
- 9) Existing Recreation and open space: Total 169012 Acres
 - No Development
- 10) Water: Total 38800 Acres
 - No Development

Appendix D
Public Participation



LEGAL NOTICES

HOLYOKE SUN
FEBRUARY 17, 1997

PUBLIC PARTICIPATION NOTICE
The Pioneer Valley Planning Commission (PVPC) will be conducting a thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. Public meetings will be held in the City of Northampton on Tuesday February 25 at 7:00 p.m. in the Council Chambers Room in the City Hall Annex and in the City of Springfield on Tuesday, March 4 at 7:00 p.m. in Room 220. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending March 19, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

UNION NEWS
FEBRUARY 17, 1997

Legal Notices	97	Legal Notices	97
Town	(Feb. 17)	on Tuesday February 25 at 7:00 pm in the Council Chambers Room in the City Hall Annex and in the City of Springfield on Tuesday March 4 at 7:00 pm in Room 220. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending March 19, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.	(Feb. 17)
PUBLIC PARTICIPATION NOTICE			
The Pioneer Valley Planning Commission (PVPC) will be conducting a thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. Public meetings will be held in the City of Northampton			

DAILY HAMPSHIRE GAZETTE
FEBRUARY 17, 1997

PUBLIC PARTICIPATION NOTICE
The Pioneer Valley Planning Commission (PVPC) will be conducting a thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. Public meetings will be held in the City of Northampton on Tuesday, February 25 at 7:00 pm in the Council Chambers Room in the City Hall Annex and in the City of Springfield on Tuesday, March 4 at 7:00 pm in Room 220. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending March 19, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

WESTFIELD EVENING NEWS
FEBRUARY 17, 1997

PUBLIC PARTICIPATION NOTICE
The Pioneer Valley Planning Commission (PVPC) will be conducting a thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Wilbraham main branch libraries for public review. Public meetings will be held in the City of Northampton on Tuesday, February 25 at 7:00 p.m. in the Council Chambers in the City Hall Annex and in the City of Springfield on Tuesday, March 4 at 7:00 p.m. in Room 220. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending March 19, 1997. For questions or additional comments, please contact Brian Piascik at the PVPC at (413) 781-6045.

Pioneer Valley Planning Commission
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LEGAL NOTICES CONTINUED

COUNTRY JOURNAL

FEBRUARY 20, 1997

PUBLIC PARTICIPATION NOTICE

The Pioneer Valley Planning Commission (PVPC) will be conducting a thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. Public meetings will be held in the City of Northampton on Tuesday, February 25 at 7:00 pm in the Council Chambers Room in the City Hall Annex and in the City of Springfield on Tuesday, March 4 at 7:00 pm in Room 220. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending March 19, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

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Pioneer Valley Planning Commission

LEGAL NOTICES

HOLYOKE SUN
MARCH 19-25, 1997

LEGALS

PUBLIC PARTICIPATION NOTICE

The Pioneer Valley Commission (PVPC) will be extending the thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Plan (TIP) Amendments until April 21. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for

LEGALS

public review. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending April 21, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

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WEEKEND GAZETTE
MARCH 15-16, 1997

PUBLIC PARTICIPATION NOTICE

The Pioneer Valley Planning Commission (PVPC) will be extending the thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments until April 21. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending April 21, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

March 15

COUNTRY JOURNAL
MARCH 20, 1997

UNION NEWS
MARCH 15, 1997

Legal Notices

PUBLIC PARTICIPATION NOTICE

The Pioneer Valley Planning Commission (PVPC) will be extending the thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments until April 21. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending April 21, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

(Mar. 15)

PUBLIC PARTICIPATION NOTICE

The Pioneer Valley Planning Commission (PVPC) will be extending the thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments until April 21. Copies of these documents have been distributed to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending April 21, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

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Pioneer Valley Planning Commission

LEGAL NOTICES CONTINUED

WARE RIVER NEWSCOUNTRY JOURNAL
MARCH 20, 1997

LEGAL NOTICE

Public Participation Notice

The Pioneer Valley Planning Commission (PVPC) will be extending the thirty (30) day public review period regarding the DRAFT 1997 Regional Transportation Plan (RTP), the DRAFT 1997 Pioneer Valley Regional Bicycle and Pedestrian Plan and the FY 1997-1999 Transportation Improvement Program (TIP) Amendments until April 21. Copies of these documents have been distributed

to the Agawam, Amherst, Blandford, Chicopee, Holyoke, Ludlow, Monson, Northampton, Plainfield, Springfield, Ware and Westfield main branch libraries for public review. The PVPC is accepting written comments during this public review period beginning February 17, 1997 and ending April 21, 1997. For questions or additional information, please contact Brian Piascik at the PVPC at (413) 781-6045.

3/20/97

Appendix E
MPO Endorsement Sheet



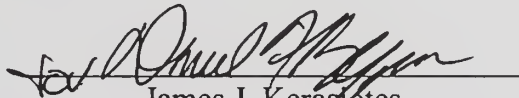
PIONEER VALLEY MPO ENDORSEMENT

The signatures below signify that all members of the Pioneer Valley Metropolitan Planning Organization or their designees have met on Wednesday, April 30, 1997 and discussed the following item for endorsement: the 1997 Update to the Pioneer Valley Regional Transportation Plan.

Executive Office of Transportation and Construction

I, Secretary of the Executive Office of Transportation and Construction, hereby

☒ Endorse ☐ Do Not Endorse the above referenced item.

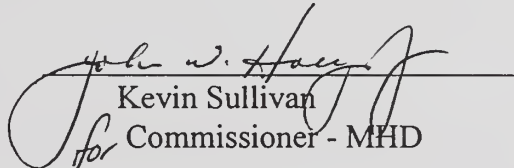

James J. Kerasiotes
Secretary - EOTC

4/30/97
Date

Massachusetts Highway Department

I, Commissioner of the Massachusetts Highway Department, hereby

☒ Endorse ☐ Do Not Endorse the above referenced item.

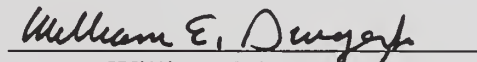

Kevin Sullivan
for Commissioner - MHD

4-30-97
Date

Pioneer Valley Planning Commission

I, Chair of the Pioneer Valley Planning Commission, hereby

☒ Endorse ☐ Do Not Endorse the above referenced item.

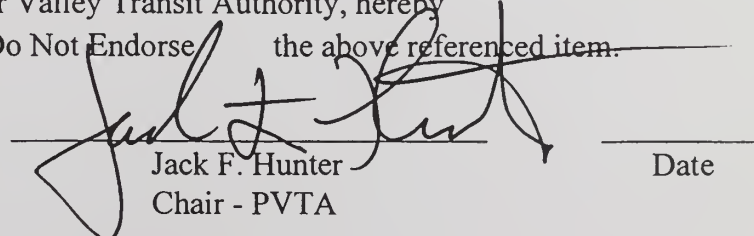

William E. Dwyer, Esq.
Chair - PVPC

4/30/97
Date

Pioneer Valley Transit Authority

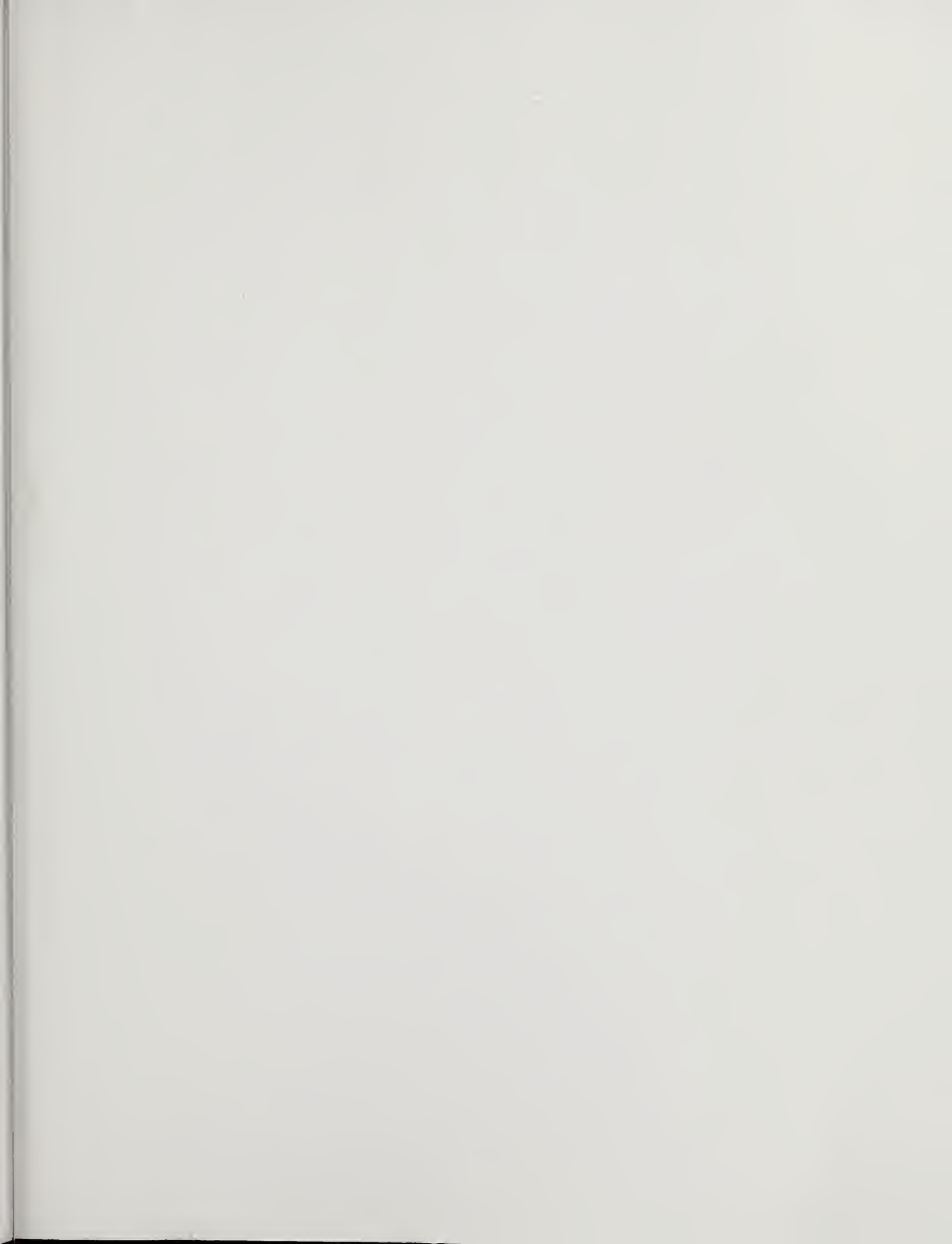
I, Chair of the Pioneer Valley Transit Authority, hereby

☒ Endorse ☐ Do Not Endorse the above referenced item.


Jack F. Hunter
Chair - PVTA

Date







**PIONEER VALLEY
PLANNING COMMISSION**

26 Central Street • West Springfield, MA 01089
(413) 781-6045 • <http://www.pvpc.org>